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JOURNAL
OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

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THE SIXTY-NINTH ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN NEW ORLEANS, LA., SEPTEMBER, 1921

The 1921 meetings of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will also be held in New Orleans during Convention Week

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ÉMILE BOURQUELOT

PARIS, FRANCE

Chairman Revision Committee, French Codex

Elected Honorary Member of the American Pharmaceutical Association, 1919

ÉMILE BOURQUELOT

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. IX AUGUST 1920 NO. 8

ÉMILE BOURQUELOT.

Professor Émile Bourquelot—member of the Academy of Medicine, Paris; Professor of Galenical Pharmacy, Paris School of Pharmacy; Chief Pharmacist in the famous Laënnec Hospital, Paris; member of the Academy of Science; member of The Council of Hygiene and Public Health, Department of the Seine; member of Permanent Commission on Codex, etc., etc.—

This renowned scientist and investigator, a member of some twenty-five scientific bodies scattered throughout the world, has been signally honored at home and abroad for his unique and untiring researches in the realms of hygiene, pharmacy, biochemistry, etc., having given particular attention to the soluble ferments, non-sugary hydrocarbons, and glucosides, and having developed new methods of employing soluble ferments as reagents in biochemistry.

M. Bourquelot has devoted much time and labor to investigating the cause of poisoning from eating mushrooms, with a view to ascertaining with certainty in what particular species the poisonous principle forms—why, how, and when it forms, and how it can be controverted. He has published a great number of articles and brochures upon the subject of Mycology, contributing valuable practical and scientific information relative to mushrooms.

Professor Bourquelot has also published a number of historical sketches relating to Pharmacy and Chemistry, which have added greatly to our knowledge of the lives and achievements of those ancient workers whose labors constitute the sub-structure of these allied arts, even to this day.

He is editor of *The Bulletin of the French Mycological Society* and of *The Journal of Pharmacy and Chemistry;* contributor of fifteen leading articles in "Ricket's Dictionary of Physiology;" contributor of numerous articles on Soluble Ferments in the "Biologic Year"—a mere list of the various researches carried out by this savant would fill half the pages in an issue of this JOURNAL.

The number of works undertaken and carried to conclusion, runs to over 300, which necessarily means thousands of experiments, many of them very complex and tedious. One can only wonder how this tireless worker could possibly accomplish all that he has given to the scientific world.

Professor Bourquelot is an honor and an ornament to his profession—and scientists everywhere honor him accordingly. He is chairman of the Revision Committee of the French Codex, and was elected honorary member of the American Pharmaceutical Association in 1919.

WILLIAM H. GANO.

EDITORIAL

E. G. EBERLE, Editor 253 Bourse Bldg., PHILADELPHIA

MAJOR-GENERAL GORGAS A BENEFACTOR OF MANKIND.

THE activities of Major-General William C. Gorgas came to an end in England on our National Holiday, but the results of his achievements will continue to benefit mankind. He was on his way to Africa where further duties were awaiting this man to whom "the nations of the world appealed when threatened by deadly plague or perilous infection." Though the discoveries upon which his methods of sanitation were based were not his own, he applied them practically and on a large scale, and he would have been the last one to underestimate the work of Lazear, Finlay, Agramonte, Reed and others which made possible the success of his own.

Born in Mobile, where, in his earlier days, yellow fever claimed many victims, he lived to plan the means and methods whereby, in the words of Secretary of War Baker, "his work practically made an historic disease of what was once a virulent plague." That he should be summoned while on a mission preparatory to further service in the field wherein he was leader gives a tragic and dramatic touch to his ending, characteristic of his career; victor of a dread disease, he succumbed to another, nephritis.

America, through this distinguished sanitarian, participated in a service of the type which has honored the United States among the nations of the world and is an inspiration to its citizens. We may refer with pardonable pride to the incentive of our country in helping Cuba, and its part in the world war, as we pay tribute to a benefactor of mankind and acknowledge the inestimable value of the work of Doctor Gorgas. What he did for Cuba and the Canal Zone was service for the world, not merely through the immediate benefits and benefactions, but by proving that disease can be controlled and plagues can be checked. Coöperation is an essential factor in all worth-while achievements and, therefore, without taking away any of the credit which medicine and sanitary science are entitled to, the contributory work of their related branches share, as also the military and civil authorities, who gave support to the undertaking that made victory over malarial diseases possible.

The supreme services of Major-General Gorgas were acknowledged by the world before he passed away and, while his wish to free all inhabited portions of the world where malaria saps and destroys life was not granted, he was permitted to prepare others for continuing his work. Pasteur established the germ theory, but the investigations as to how the germs are conveyed remained for individual workers and also how to destroy the carriers; among the foremost of those who studied and put into practice the means of preventing infection is the hero of Cuba and Panama.

"The Commemoration Volume," published by the American Medical Association in 1915 as "a tribute to the memory of those workers who made the build-

ing of the canal and the significance of the Panama Exposition possible," contains a contribution by the then Surgeon-General Gorgas, which closes with the following paragraph:

"I think we are on the eve of one of the great sanitary triumphs of man, the first eradication of a disease from the face of the earth, due to the measures taken by man for this purpose. When this has once been accomplished, yellow fever can never return, no matter how unsanitary we are, or how many stegomyia we allow to breed. The yellow fever germ can no more be redeveloped than can the mastodon or the saber-toothed tiger." E. G. E.

NONE OF US LIVETH TO HIMSELF.

SOME men think only in terms of themselves, some of States, others of still broader vision of nations, some in terms of the whole human race. The thought is applicable to pharmacists and those who supply them—with some it is solely a matter of sale and resale, while others are more deeply concerned. In the restricted view others are not considered, the welfare of the profession or business is merely incidental; those of broader vision seek to promote not only their own welfare but the advancement and progress of those similarly engaged, so that humanity may be best served. The former seek personal gain, the others a greater usefulness, and recognize their duties to their fellowmen. So it is with nations; advanced thinking, improved methods of transportation, communications, and economic conditions make self-isolation and working solely for their own interests prejudicial, if not impossible.

The foregoing editorial spoke of the world-service of a man and the spirit which actuated the United States to serve the world; a spirit, which we are pleased to term the spirit of Americanism, whereby not only big things, but good things, are accomplished. A recent editorial of the *New York Commercial* said: "We are charged with being a nation of money-makers, which is true enough, but we are not money-makers in the cold-blooded sense our critics would have the world believe. On the contrary, we are a nation of idealists, emotional and temperamental, and when aroused, inclined to go to extremes. As a nation we want to do what is right. We want to be honest and just. We may not always be able to express these desires through our political representatives, and sometimes we may stray far afield, but usually we swing back to our ideals and try for a new start."

In the hurry and rush of daily affairs and personal interest we must at times pause and reflect on the course of events in our business and profession. The present is a time when men of vision are needed, who have sufficient prescience to visualize conditions in pharmacy. Thoughtful anticipation should suggest foresighted preparation for changing conditions and development in pharmacy and in the drug business, due to legislation and our responsibilities thereunder. "Am I my brother's keeper?" can only be answered in the affirmative by nations and individuals. All of these thoughts enter into the purpose of this editorial, which is to be restricted to our obligations under the prohibition and narcotic laws.

The greater number of pharmacists would prefer to discontinue the sale of alcoholics and narcotics under all circumstances but, in our opinion, it becomes a

duty to supply them on physicians' orders. Both of these subjects were discussed in the Sections of the American Pharmaceutical Association at the recent convention in Washington. Pharmacists are generally regarded by the public to be upright and dependable, and to maintain that regard it is essential that every possible assistance be given to the enforcement of the prohibition law. Prohibition Commissioner John F. Kramer said: "It is not the province and the duty of the officials of the land alone to see that the laws are obeyed, but it is the duty and province of every American citizen, as far as possible, to see that the laws of the land are obeyed and respected." And again, he said: "It takes only a few men in any profession to bring all the members into disrepute." These are important matters; it is a duty to guard the profession, by keeping those out of it who lend themselves to bringing disrepute on themselves, and thereby on others, and when unfair, insinuating reflections are made by slanderers or by the press, to deny the charges, if untrue, or define the attitude of pharmacists toward those who "have traded an honorable name for the unworthy title of 'bootlegger.'" Applying the conclusion of an editorial in the *Journal of the American Medical Association* on the subject of "Prohibition and the Medical Profession" to pharmacy: "For the good name of *our profession* it should be made known to the public in an emphatic manner that such disreputable practices on the part of any *pharmacist* are not condoned. *Noblesse oblige.*"

Relative to the narcotic question the attitude of pharmacists is well defined; the subjects of discussions before the various Sections of the American Pharmaceutical Association related largely to importation, exportation and manufacture, and the action or non-action of the Government. The war largely interfered with the consummation of international control of narcotics. Our views relative to America and American manufacturers have been stated, that as a nation we want to do what is right. We want to be honest and just. We may stray far afield, but usually we swing back to our ideals and try for a new start. That making narcotic slaves of so populous a nation as China, or any people for that matter, constitutes a serious menace to the world is unquestionable. Aside from that, it is not honest and just; the United States will not stand for it, and the American manufacturers will be found among the foremost to aid in regulating such traffic when the governments take up this very serious problem. The war brought an upheaval and changed the viewpoints on a number of things, some temporarily, and reconstruction is needed along certain lines.

"The very first thing we should do is to renew our faith in ourselves as a people, not vaingloriously, but in the knowledge that we are capable of doing great things and that whatever tasks we set ourselves to do we can accomplish." None of us liveth to himself.

E. G. E.

THE NATIONAL FORMULARY.

The National Formulary Committee held a meeting at Longport, N. J., early in July which will be of far-reaching importance. The Association is to be congratulated on having a committee for the revision of the National Formulary which is not only able and well balanced, but is willing to work. Every member of the committee of fifteen was present, and every member put in all his time between meals in solid and steady labor. What was accomplished in the two

and a half days of personal conference is fully equal to six months of work by correspondence, and will prove to be much more satisfactory. At Longport the National Formulary had undivided and concentrated attention. Longport was chosen for the meeting because the vicinity of Philadelphia is the most central and economical place for meetings of this committee, and Longport has a better climate than Philadelphia in July, and cheaper hotels. The weather was fine.

The original purpose of the National Formulary was to make easily available standard formulas for preparations in common use by physicians, and to supply preparations as they are being used. If the Formulary had continued as an unofficial book, this policy might have continued wisely, but since the book has been recognized as an authority in pharmacal and medical practice something more than a perpetuation of formulas is needed. It is but reasonable to expect that not only shall the formulas be satisfactory for the preparations which they represent, but that the preparations themselves shall be pharmaceutically and scientifically sound. Inasmuch as the N. F. has not assumed and cannot assume authority for the therapeutic value of a preparation, it cannot revise formulas on the basis of therapeutic efficiency; but, on the other hand, it cannot ignore therapeutic incompatibility. The prescription pharmacist is not expected to be a therapeutist but he is expected to be able to detect and prevent the administration of dangerous doses, or of incompatibilities that are dangerous. So the National Formulary, while it cannot endorse or assume responsibility for therapeutic values, yet it cannot entirely ignore therapeusis.

In this connection we may call attention to the fact that the N. F. contains a number of preparations which, while they contain medicinal agents of mild form, are yet essentially vehicles. The former Compound Digestive Elixir, over which there has been so much controversy, is of this type. It has some digestive power, but its main use is as a vehicle. Therefore, the important factor in this preparation is its aesthetic quality, not its therapeutic action. It must be attractive in taste and appearance. Its digestive power is quite secondary, though it too must be considered. Now by eliminating the pancreatin in this preparation its value as a digestive vehicle will be retained while its contradictory therapeutic quality will have been dismissed. It is this sort of therapeutic judgment that the National Formulary is qualified to exercise and should assert. And this sort of therapeutic supervision will be practiced in the present revision.

It will seem a little foreign, at first, to take liberties with old formulas, but that is the essential province of revision. The Pharmacopoeia had to go through this kind of evolution. The first preparations of the early Pharmacopoeias were articles which had been introduced to medical practice as secret or proprietary preparations; and if science had not been stronger than tradition in the minds of the revisors, paregoric would still contain licorice and be a muddy mixture, Huxham's tincture would still contain saffron, Friar's Balsam (where did these names originate?) would contain balsam of Peru, myrrh and olibanum, etc. But revision meant the elimination of the non-essential as well as of improvimg composition and methods, and thus the Pharmacopoeia has gained in influence. So the way opens to the National Formulary—the way of improvement, the way of ethical and

pharmaceutic soundness, the way of leadership rather than following. Thus may the Formulary increase in influence and make for itself an enlarged place in pharmacy.

The Longport meeting served to clarify and unite the revision committee on the principles to be followed in revision. Its work was fundamental. It came away united in aims, clear in purpose, and with a keener sense of the mission and position of the National Formulary.

Two and a half days of deliberation was required, not because there were divisions in the Committee, but because the fundamentals require careful and unhurried consideration. And most of the time was spent on the fundamentals.

Further details of the principles considered will be published later. The Committee will seek publicity in its work, and proposes to ask the opinion of pharmacists on all important changes before they are finally adopted. There is no secrecy in the work. The Committee regards itself as simply a representative body which needs and will ask for the support of its constituents in all the work of revision. The general principles of revision which were outlined will soon be published in detail, and also a list of proposed deletions and additions.

W. L. S.

AT NEW ORLEANS MEETING OF AMERICAN PHARMACEUTICAL ASSOCIATION, APRIL, 1891.

Left to right: E. J. Kennedy, E. L. Patch, Joseph P. Remington, S. L. Hilton and G. Rampsberger.

NEW TESTS FOR SOME PURGATIVE DRUGS.*

BY E. H. GRANT.

This paper describes some new tests for the identification of the following purgative drugs listed in the United States Pharmacopoeia IX and National Formulary IV: Scammony Root, Jalap, Gamboge, Podophyllum, Senna, Rhubarb, Cassia Fistula, Chionanthus. The arrangement of these drugs in this paper is for convenience in describing the various tests, bringing similar ones together, rather than by a botanical or other systematic scheme. The reader is referred to the above mentioned authorities for a full description of the drugs.

Scammony.—The sample, after being dealcoholized by evaporation if it contains alcohol, is extracted with chloroform. The chloroform extract is evaporated in a small beaker, and after cooling, the residue is treated with 2 mils of a cold alcoholic solution of potassium hydroxide (40 grammes per liter). In the presence of scammony a pleasant, fruity odor slowly develops. On heating, the odor is intensified slightly and often changes to one resembling that of peppermint. In the cold, leptandra gives a faint, scarcely noticeable odor which can be easily distinguished from that given by scammony if samples of each are run for comparison. On heating, the odor given by leptandra is very rapidly intensified. For this reason, care must be taken not to add the potassium hydroxide solution until the beaker is cold. Jalap is slightly soluble in chloroform in the presence of alcohol and will give a slight odor in this test if alcohol is not excluded. Mexican scammony (*Ipomoea orizabensis* Ledanois) acts similarly to scammony, but the two odors may be distinguished if compared with those given by authentic samples of each of the drugs.

Jalap.—The sample, freed from alcohol, is extracted with chloroform, as noted above, until all of the scammony is removed. It is then extracted with ethyl acetate, the solvent is drawn off and evaporated. The residue on evaporation is allowed to cool and is then treated with 2 mils of the potassium hydroxide solution. In the cold, very little odor develops, but on heating slightly there is a strong, ethereal odor, very similar to that given by leptandra.

Leptandra.—The sample is extracted with a mixture of alcohol (1 part) and chloroform (3 parts). A portion of this extract is evaporated and the residue treated with alcoholic potassium hydroxide. In the cold, only a very faint odor develops. On heating slightly a strong, fruity odor develops. The solution is heated a few minutes on the water bath to saponify the resins, then diluted with water, acidified with dilute hydrochloric acid and extracted with chloroform. This extract is evaporated, and the residue when cold is treated with saturated potassium permanganate solution. An odor of benzaldehyde develops. This test depends on the cinnamic acid derivatives 3 : 4 dimethoxycinnamic acid and *p*-methoxycinnamic acid.[1] It cannot be used to identify leptandra when present as the eclectic concentration "leptandrin" or similar preparations, since these acids are washed away during the process of manufacturing the concentration.

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* Read before Scientific Section, A. Ph. A., City of Washington meeting, 1920.

[1] Powers and Rogerson, *Trans. Chem. Soc.*, 97, 1944–56, 1910.

As jalap is only very slightly soluble in chloroform-alcohol mixture and leptandra only slightly so in chloroform, the three drugs above mentioned can be differentiated with care.

Gamboge.—This drug is characterized by its intense yellow color, soluble in most of the organic solvents.

Four mils of an ether extract of the sample are shaken with 12 mils of water and 0.5 mils of a 0.5% copper acetate solution. If gamboge is present, a brownish orange to blood red color is produced in the ether.

By the use of the above tests and the usual tests for aloes and calomel, it is possible to identify aloes, scammony, jalap, gamboge and calomel all in the same three compound cathartic pills U. S. P.

Podophyllum.—The sample is extracted with chloroform, a portion of this extract is evaporated and the residue taken up in 2 mils of glacial acetic acid. A small crystal of mercuric nitrate is added. A red orange to blood red color is produced in the presence of podophyllum. Sometimes aloes or wild cherry bark may give a scarcely perceptible change in color under these circumstances. If a drop of nitric acid or a small crystal of sodium nitrite is substituted for mercuric nitrate, podophyllum gives the same color as it does with mercuric nitrate, while sometimes aloes and wild cherry bark give strong colors, resembling that given by podophyllum. This test will detect 0.01 gramme of podophyllum in the presence of 0.2 gramme of aloes, and in the proven absence of aloes will give indications of the presence of smaller amounts of podophyllum.

After I had discovered this test, I came across a reference in the literature which I have since been unable to locate again, to the coloration given by podophyllotoxin with nitrous acid in glacial acetic acid, but no mention was made of aloes or wild cherry bark.

Senna and Rhubarb.—Considerable work by numerous chemists has been done on the identification of drugs containing oxyanthraquinone derivatives. Senna is the most troublesome of these drugs to identify, on account of the slow chemical changes in these oxyanthraquinone derivatives which take place in its extracts on keeping, but all of these drugs show more or less change. The method of preparation, the menstruum used and the age of the extract all have profound influences on the depth and shade of color obtained in the various color reactions. A fresh, aqueous infusion of senna gives the Bornträger reaction only faintly or not at all. In attempting to identify senna when present as the whole or ground leaf, it is best to extract with dilute alcohol and apply the tests to this extract rather than to extract the sample with chloroform or ether direct, or to make an aqueous infusion.

The following test is given by senna, rhubarb, or rhapontic rhubarb (*Rheum raponticum* L.), but not by any of the other drugs. If the sample is in liquid form, it is acidified with dilute hydrochloric acid and enough alcohol or water is added to adjust the alcoholic content to about 20%, and then the mixture is extracted with chloroform. If the sample is in solid form, it is acidified and extracted with a mixture of chloroform, 3 parts, and alcohol, 1 part. This extract is shaken in a glass stoppered cylinder with an equal volume of saturated bromine water. A few drops of ammonia water, slightly more than enough to combine with all of the bromine, are added and the mixture is again shaken. After effervescence from

escaping nitrogen has ceased, the aqueous layer should separate out fairly colorless. If it has a strong pink tint, an insufficient amount of bromine was used and the test must be repeated. The cylinder is then allowed to stand undisturbed for an hour. In the presence of senna rhubarb, or rhapontic rhubarb, a pink zone slowly forms in the liquid immediately over the chloroform and finally spreads through the aqueous layer. In the presence of frangula a slight, pink coating forms over the chloroform, but this color is insoluble in the aqueous solution. In the presence of the other drugs of this group, or of phenolphthalein, no pink coloration is formed, and even large amounts of these drugs or of frangula do not interfere with the detection of senna and rhubarb.

Since all of the color in this test is concentrated at first in a very narrow zone, thus showing off in contrast with the rest of the aqueous layer, foreign coloring matters do not interfere as much as they do with some of the other color tests for this group of drugs. The limit of sensitiveness of this reaction is about 20 milligrammes of either rhubarb or senna, which is not quite as delicate as the Bornträger reaction. The presence of considerable alcohol is absolutely essential in the test.

Butternut Bark of Root and Cassia Fistula.—Both of these drugs contain compounds which give red or pink colors in the Bornträger test. The coloring matter in butternut bark is too easily destroyed to be of very appreciable value as an aid in identifying this drug. It is destroyed or rendered insoluble in the process of making a pilular extract of the drug, but it may sometimes be identified in liquid preparations which contain the fluid extract of butternut bark.

The sample is acidified and extracted with chloroform. This extract is shaken with a small amount of 10% sodium acetate solution. The aqueous layer is brownish yellow in the presence of cassia fistula or the above mentioned coloring matter from butternut bark. The sodium acetate solution removes the coloring matter of these two drugs very completely from the chloroform and does not extract any of the oxyanthraquinone derivatives (emodin, etc.), which may be present at the same time. The purified chloroform extract can be used for the identification of drugs containing such derivatives (cascara sagrada, senna, etc.). A small amount of the brown coloring matters in cascara is removed in this process, so that the color reactions given by this drug after purification of the extract will be a clearer pink, with less of a brown tint, than in the ordinary way of making these tests.

Sodium acetate solution will remove not only the coloring matters from cassia fistula and butternut bark, but also a host of other natural coloring matters which would otherwise interfere with the Bornträger and other reactions. Whenever, in testing for emodin, the analyst gets a yellow color on shaking the chloroform extract with dilute ammonia, it would be well for him to purify the extract by shaking it with sodium acetate solution.

The sodium acetate solution containing the coloring matters from cassia fistula or butternut bark is removed, acidified and extracted with chloroform. Separate portions of this chloroform extract are removed and shaken with various alkaline solutions. Butternut bark gives a pink color with ammonia and brown with solutions of borax or sodium phosphate. Cassia fistula gives a more or less pink color according to the alkalinity of the solution. It gives a pink color in the aqueous layer if the chloroform is shaken with dilute solutions of ammonia, bleach-

ing powder or borax, pink with a brownish tinge with sodium phosphate solution, very light pink with sodium benzoate solution and yellow with sodium acetate solution. The chloroform in each case becomes colorless. Sodium chloride solution or distilled water alone do not extract any of the color from chloroform.

Chionanthus.—The sample is extracted with chloroform. Separate portions of this extract are evaporated and treated with concentrated sulphuric acid containing the various chemicals noted.

Concentrated H_2SO_4 alone—red, developing only after a few minutes. On the addition of formaldehyde (40% solution) to the above, the color is intensified and takes on more of a violet hue. The color with sulphuric acid and formaldehyde develops immediately and not after a short time, as with the acid alone.

H_2SO_4 + $K_2Cr_2O_7$—violet, changing to brown.
H_2SO_4 + Ammonium Vanadate—purple with red streaks, finally all purple.
H_2SO_4 + $FeCl_3$—reddish brown changing to purple.
H_2SO_4 + Phenol—orange.
H_2SO_4 + Alphanaphthol—cherry.
Fröhde's reagent—brown.

SUMMARY.

New tests are described for the identification of scammony root, jalap, leptandra, gamboge, podophyllum, senna, rhubarb, cassia fistula and chionanthus when present in galenical preparations. The tests for gamboge, podophyllum, senna, rhubarb and chionanthus are quite characteristic. The other tests while being far from conclusive are of value in assisting to identify the drugs.

RESEARCH LABORATORY,
THE WM. S. MERRELL CO.
CINCINNATI, OHIO.

ABSTRACT OF DISCUSSION.

E. L. PATCH: In the carrying out of color tests on mixtures we should bear in mind that there are many substances, the nature of which are unknown, that may give the color tests which we would limit to a specific substance. I recall in working upon color tests for cod liver oil that nearly all fish liver oils, regardless of the species of fish, gave similar color reactions. I would, therefore, advise extreme care in applying color tests to organic mixtures.

ARNO VIEHOEVER: We must admit that these tests are only make-shifts. However, that fact should not condemn them, as they are of great service to the average druggist who has neither the time nor facilities for isolating the active principles of the drugs and mixtures which he is compelled to test and who is forced to depend on the help which he has in his store to carry out these tests.

ALEXANDER G. MURRAY: It is true that color reactions which are not performed upon the isolated principle but upon mixtures are open to objection as the possibility of error is very great. But those of you who have had experience in the analysis of medicinal preparations of unknown composition, particularly patent medicines, will appreciate the usefulness of these tests; even though they cannot be depended upon entirely, they at least may give some indication of what is present and thereby point out to the analyst what he may expect to find, thus permitting him to select more accurate methods for confirming these findings. I happen to know that Mr. Grant has done careful work on the methods which he has reported and that they are not merely make-shifts.

E. H. GRANT: I realize as well as any of you that these methods do not yield dependable results in all cases, but some indication of what is present in a mixture is better than nothing at all.

PROPOSED VEGETABLE DRUG DELETIONS.*

BY A. RICHARD BLISS, JR.

INTRODUCTORY.

In the preface to the second edition of "Useful Drugs,"[1] we find the following statements:

"It has long been recognized that the multiplicity of drugs and preparations of drugs presented to the attention of the medical profession is an evil. Leaving out of account the articles described in the N. F. and the vast number described in dispensatories and similar unofficial compilations, the number of drugs and preparations described in the Pharmacopoeia alone is far too large for intelligent practical use. *Of even greater importance is the well-known fact that a considerable proportion of Pharmacopoeial drugs and preparations are superfluous or worthless.* Repeated attempts to eliminate such articles from the Pharmacopoeia have failed because they have uniformly encountered the objection that articles or preparations are used by some physicians and, therefore, should be recognized and authoritatively defined."

In accordance with the general trend of medical progress less and less attention and space in the medical school curriculum are being given to those drugs and preparations that are looked upon by medical authorities as being of minor importance, questionable utility, and doubtful reliability. Some of the latest editions of standard, recognized textbooks have gone further by absolutely omitting the greater proportion of such agents. Most of us will doubtless agree that the host of substances, good, bad and indifferent, that were introduced to us in the college of pharmacy courses in Materia Medica, Pharmacognosy, etc., because of their very number, materially affected our interest in the subjects and led to considerable confusion and discouragement. This has been true not only in the college of pharmacy but also in the medical college. A movement to restrict the instruction in Materia Medica in the medical schools and the examinations in Materia Medica by State Medical Examining Boards to the more important drugs was initiated by the Council on Medical Education of the American Medical Association and the Confederation of State Examining and Licensing Boards. After numerous conferences with the State Examining Boards, professors of Materia Medica, deans of medical schools, and other members of the medical and pharmaceutical professions, the Council on Pharmacy and Chemistry of the A. M. A., following a thorough and careful sifting process, published "A Handbook of Useful Drugs," which is now being used as the basis of instruction in practically every Department of Pharmacology of the medical schools, and is also being used by the large majority of State Medical Examining Boards as the basis of examinations in "Materia Medica and Therapeutics." The first edition appeared in 1913 and ushered in a long, looked for and thoroughly welcome change in the scope of teaching in this particular branch of medical science. Although practically every medical school and the large majority of State Medical Examining Boards are heartily coöperating in this work, it is doubtless a fact that the larger number of our schools of pharmacy are still clinging, for some reason or other, to the old method of trying to cram the pharmacy student full of information concerning

*Read by title, Scientific Section, A. Ph. A., City of Washington meeting, 1920, hence, no discussion.

[1] Press of the American Medical Association, Chicago.

every known member of the Materia Medica regardless of its usefulness or uselessness in the treatment of disease, regardless of whether or not it is being used by the medical profession.

Why waste valuable time and energy on Pyrethrum, Mezereum, Xanthoxylum, Matricaria, etc., of the U. S. P., and Asclepias, Papaveris Fructus, Trifolium, Verbena, Echinacea, and a host of others of the N. F.? Why assist, by including these substances among the drugs taken up in the courses of the pharmacy school, in attempts to retain or to introduce such substances into the U. S. P.? Why encourage movements to introduce as many substances as possible, including so-called "household remedies," insect powders, and other substances infrequently used as medicines, foods, reagents, etc., simply to have official and legal standards for the same? By taking part in such movements, intentionally or unintentionally, one assists in promoting still further departure from the original idea of the Pharmacopoeia. A Pharmacopoeia, we are taught, is a book which defines and standardizes *certain* drugs and preparations, and whose aim is to establish definiteness for a *selected number of those substances extensively used and recognized as possessing real worth in the treatment of disease by the physician.* The U. S. Pharmacopoeia was founded by the medical profession, and was at first an *exclusive physician's Pharmacopoeia.* Since 1840, however, the revisions have come more and more under the control of the pharmacist, and the work is gradually becoming a manufacturer's book of specifications and standards, and less and less of a guide to the medicinal agents *prescribed by the medical profession.*

Why defend the presence in or the introduction into the Pharmacopoeia of substances which have been proven to be of no real value in the treatment of disease by saying that they are used by *some* physicians and, therefore, should be recognized? The real worth, the absolute value of a substance as a medical agent should be proved, such proof recognized, and the real practical value further proved by *extensive* use before it is admitted to the U. S. P., and all substances now in the Pharmacopoeia that do not meet these requirements should be deleted. Put them in the N. F. or elsewhere if you please, but get them out of the U. S. P. and keep them out. The writer ventures to state that unless the requirements for admission to the N. F. are made somewhat more stringent, this valuable work will gradually become the dumping ground for discarded members of the Materia Medica and slowly lose its prestige.

The approach of the U. S. P. Convention with that part of the program devoted to the subject of deletions prompted the writer to attempt to secure the opinions of the members of the medical profession in the City of Atlanta concerning one phase of this important work—Vegetable Drug Deletions. Accordingly a list of 121 U. S. P. vegetable drugs (excluding "active principles" like the alkaloids, glucosides, etc.), was compiled and mailed to the entire medical profession of Atlanta with the request that each man study the list and then strike out those drugs that he believed it would be wise to drop from the U. S. P., giving, in each case, very, very briefly his reasons for such recommendation. It is hoped that others may carry out a similar study of the vegetable drugs in other sections, and also that the chemicals of the U. S. P. may be taken up in the same fashion. A study of the prescription files of the retail pharmacists of Atlanta was also begun in order to determine what substances are actually being prescribed by the medical

profession of this city. The data, although incomplete, is nevertheless too bulky to digest and to condense in time for this meeting. It will, therefore, be completed at a later date and used as the basis of another paper. The State of Georgia has a population of about 3,000,000, with a total of about 3,442 physicians. The City of Atlanta has a population of approximately 300,000 and a total of 513 physicians. The medical schools of practically every section of the country are represented by these men. Of the 513 physicians, 387 responded to the letter sent them. Therefore, the results of the communication represent the opinions of something over 75 percent of the medical profession of Atlanta.

DATA SECURED.

The replies show that the only U. S. P. vegetable drugs concerning which there is absolute unanimity of opinion are:

1. Aloes	2. Asafetida	3. Aspidium
4. Balsam of Peru	5. Balsam of Tolu	6. Belladona Leaves
7. Belladonna Root[1]	8. Capsicum	9. Cascara Sagrada
10. Cinchona	11. Digitalis	12. Ergot
13. Gentian	14. Glycyrrhiza	15. Hydrastis
16. Hyoscyamus	17. Ipecac	18. Jalap
19. Linseed	20. Lobelia	21. Nux Vomica
22. Opium	23. Physostigma	24. Pilocarpus
25. Podophyllum	26. Rhubarb	27. Senna
28. Black Mustard	29. Veratrum Viride	30. Ginger

Not one of the 387 who replied recommended the deletion of any of these 30 drugs listed above.

The following table gives the list of drugs along with the percentage of the 387 Atlanta physicians that advised deletion in each case. The foregoing thirty drugs are omitted from the list.

	Percent.		Percent.		Percent.
Acacia	10	*Colocynth*	8	Scammony Root	*63*
Agar-Agar	12	Coriander	*60*	Senega	19
Sweet Almond	45	*Elaterin*	13	White Mustard	10
Anise	29	*Eucalyptus*	8	Staphisagria	40
Aspidosperma	*52*	Frangula	*60*	*Cardamom Seed*	28
Sweet Orange Peel	20	*Gambir*	*60*	Chondrus	*63*
Buchu	23	Pomegranate	24	Cimicifuga	37
Calumba	*50*	Guaiac	13	*Cinnamon*	13
Aconite	11	Humulus	*52*	*Colchicum Seed*	8
Althaea	*73*	Lemon Peel	25	*Copaiba*	13
Starch	10	Malt	23	Cubeb	24
Arnica	34	Matricaria	*70*	Eriodictyon	*63*
Bitter Orange Peel	40	Spearmint	23	Fennel	42
Benzoin	10	Musk	*60*	Nutgall	24
Gamboge	25	Myrrh	10	Gelsemium	10
Camphor	2	Pepo	37	Grindelia	26
Cannabis	*52*	Pepper	10	Guarana	*55*
Caraway	*50*	*Wild Cherry*	8	Kino	*55*
Clove	18	Quassia	23	Lactucarium	*68*
Chrysarobin	13	*Red Rose*	*61*	Lycopodium	23
Red Cinchona	13	Sanguinaria	*50*	Manna	*60*
Colchicum Corm	26	Sarsaparilla	40	*Peppermint*	10

[1] Several suggested that the leaves alone would do.

	Percent.		Percent.		Percent.
Mezereum	*76*	*Squill*	8	*Strophanthus*	10
Nutmeg	26	Serpentaria	*50*	Sumbul	*61*
Parsley Fruit	*60*	Spigelia	37	*Tragacanth*	20
Tar	10	Stillingia	32	Elm	*50*
Pyrethrum	*63*	*Stramonium*	8	*Valerian*	16
Rosin	30	Storax	*55*	Viburnum Prunifolium	37
Sabal	*50*	Taraxacum	32	Xanthoxylum	*61*
Red Saunders	*63*	Triticum	42		
Sassafras	*61*	Uva Ursi	37		

NOTE.—Drugs printed in Italics are found in "Useful Drugs." Percentages printed in Italics include 50 percent and above.

From the table it will be seen that 50 percent or more of the Atlanta physicians favor deleting the following drugs:

1. Althaea (73%)
2. Aspidosperma (52%)
3. Calumba (50%)
4. Cannabis (52%)
5. Caraway (50%)
6. Chondrus (63%)
7. Coriander (60%)
8. Eriodictyon (63%)
9. Frangula (60%)
10. Gambier (60%)
11. Guarana (55%)
12. Humulus (52%)
13. Kino (55%)
14. Lactucarium (68%)
15. Manna (60%)
16. Matricaria (70%)
17. Mezereum (76%)
18. Musk (60%)
19. Parsley Fruit (60%)
20. Pyrethrum (63%)
21. *Red Rose* (61%)
22. Sabal (50%)
23. Sanguinaria (50%)
24. Red Saunders (63%)
25. Sassafras (61%)
26. Scammony Root (63%)
27. Serpentaria (50%)
28. Storax (55%)
29. Sumbul (61%)
30. Elm (50%)
31. Xanthoxylum (61%)

Here, then, are 31 vegetable drugs that from 50 to 76% of a representative body of physicians advise deleting from the U. S. P. Among the brief reasons given are "inert," "useless," "limited utility," "obsolete," "worthless," "never used," "questionable value," "no advantages over other U. S. P. drugs of similar activity," "preparations unreliable and not uniform." It is interesting to note that of the 31 drugs, but one (Red Rose) is found in "Useful Drugs." It is also of interest to note that, with the exception of Red Rose, the percentage of physicians advising the deletions of other "Useful Drugs" was very low, Camphor being lowest with but 2% favoring its deletion, and Cardamom next highest to Red Rose with 28%. The remaining ones run close to 10%.

There is not a single drug in the above list of 31 proposed for deletion by 50% or more of the Atlanta men that possesses any medicinal actions or virtues which demand its presence in the U. S. P. and recognition as an important medicinal agent. There is not a single member of this list possessing any useful physiological action that is not also possessed by one or more of the remaining members of the U. S. P. There is not a member of this group possessing any particular redeeming virtues that demand its recognition; therefore, why retain them?

COMMENTS AND CONCLUSIONS.

In making the few comments and drawing the conclusions which follow, the writer has tried to keep in mind the original and supposedly present objects of the Pharmacopoeia, and trusts his readers will consider them from the same standpoint. No attempt will be made to comment on all of the drugs proposed for deletion, attention being given only to those about which there is a fair degree of

unanimity of opinion, along with a comment or two concerning a few drugs the writer believes should be included in the list of 31 drugs referred to above.

It was rather surprising that a greater number did not advise deleting:

1. *Aconite*, the use of which is constantly diminishing, because the dangers attending its depressant action on the heart make it a rather undesirable agent to be used as a cardiac depressant. Only 11% advocated its deletion.

2. *Squill*, a drug rather carelessly used as an expectorant in numerous "stock and cough remedies," as well as in prescriptions. It has physiological actions that very closely resemble those of Digitalis, although it is true that the emetic action is more pronounced. However, since we have other nauseating expectorants, like Ipecac for example, with less undesirable side actions, it seems unwise to use Squill which affects the heart so powerfully. The writer is confident that the deletion of Squill will mean a loss to nobody. But 8% advised its deletion, although prescription files shows that it is gradually falling into disuse.

3. Pepo, a drug once used as an anthelmintic, but which has been proved to be absolutely worthless. Thirty-seven percent advised its deletion.

4. Gelsemium, a drug looked upon by practically all authorities as a peripheral depressant of no great medicinal importance. Only 10% advocated its deletion from the U. S. P.

Very briefly then, the 31 drugs listed on page 770 as worthy of being deleted from the U. S. P. might well be dropped in the Tenth Decennial Revision for the reasons here stated.

In addition to these 31, it is the writer's firm belief that the following might also be dropped since they too possess no redeeming properties or virtues that entitle them to consideration as *important, extensively used, valuable, therapeutic agents:* *Aconite* (11%), Agar-Agar (12%), Arnica (34%), Buchu (23%), Sweet Almond (45%), Cimicifuga (37%), Gamboge (25%), Fennel (42%), Gelsemium (10%), Grindelia (26%), Guaiac (13%), Tar (10%), Quassia (23%), Pepo (37%), Sarsaparilla (40%), Spigelia (37%), Stillingia (32%), Pepper (10%), Taraxacum (37%), Triticum (37%), Viburnum Prunifolium (37%), and Uva Ursi (37%).

It may also be desirable in the cases of the aromatic oil drugs, like Anise, Orange Peel, Caraway, Clove, Cinnamon, Coriander, Eucalyptus, Lemon Peel, Peppermint, Spearmint, Nutmeg, etc., to delete the crude drugs and retain the volatile oils, since these are the constituents really desired and actually employed in prescription work.

A further study of this subject in other sections will most likely disclose the fact that there is general unanimity of opinion concerning the drugs included in the list of 31 above, recommended by Atlanta physicians as worthy candidates for dismissal, and possibly also add several more drugs to the deletion list.

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SUGGESTIONS FOR IMPROVEMENT OF U. S. P. ASSAY PROCESSES.*

BY FRANTZ F. BERG.

The Pharmacopoeia is now used by a great many chemists in various industrial enterprises for the control of materials purchased on U. S. P. specifications or for purpose of determining the quality of a finished product.

Many of the tests and assay processes of the Pharmacopoeia as now laid down are designed for use by a pharmacist, and the equipment and wording of tests are governed by this assumption. These methods of assay are used to a larger extent by the chemist in a well-equipped laboratory, who might on many occasions use a slight modification as a time-saver and procure in many cases more accurate results. The methods as set forth by the U. S. P. are necessarily official, and in view of this fact the chemist so situated must often carry out a process which he could do quicker and better in another way.

In many cases this condition could be remedied by allowing an alternative method or an alternative piece of apparatus, which would not in any way be detrimental to the book as a legal standard.

The Pharmacopoeia contains some preparations for which no assay processes are appended but which are required to meet certain standards in various states, or as in the case with Solution Cresol Compound by the Insecticide Act it is required to bear a statement as to water content. A dispute may often arise where the analyses of such preparations are made by different methods. If the Pharmacopoeia is to continue as a legal standard it would be desirable to include methods of assay for ammonia content in Aromatic Spirit of Ammonia, water in Compound Solution of Cresol, an assay for filicin in Oleoresin of Aspidium and assay for Hexamethylamine. Some of the tests give rise to various interpretations, and cause confusion, owing to varied construction which may be placed on such phrases as absence of and presence of, when placed in parenthesis after a test which may be taken to mean an impurity, or absence of such impurity.

The following suggestions and criticisms are offered for improvement of the assay processes of the forthcoming Pharmacopoeia:

SUBSTITUTE FOR OAK SAWDUST IN THE ASSAYS OF FLUIDEXTRACT OF IPECAC AND FLUIDEXTRACT OF CINCHONA.

It has been my experience on many occasions that a source of oak sawdust was not at hand, and could not be procured without considerable delay. It was this condition which caused me to cast about for some other media as an absorbent.

The material which first suggested itself as a substitute was acid washed neutral asbestos fiber such as is used in preparing filter mats for Gooch crucibles. This material can always be found in the market, and requires less time to purify than does sawdust, or in the case of chemical laboratories asbestos is always on hand in purified state. After some experimentation the following modification of the U. S. P. assay for Fluidextract of Ipecac was found to give concordant and reliable results.

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*Read before Scientific Section, A. Ph. A., City of Washington meeting, 1920.

From a pipette drop 10 mils of fluidextract of ipecac evenly over the surface of 2 Gm. of thoroughly washed neutral dry asbestos. Evaporate to dryness at a temperature not exceeding 80° C. Transfer the impregnated asbestos to a 250 mil flask, add 100 mils of ether. Rinse the dish, in which the mixture was evaporated, with 6 mils of ammonia water diluted with an equal volume of water (using a glass rod to remove any fibers that adhere too firmly to dish), add this to the flask, stopper the flask and shake it vigorously every few minutes for two hours. After the asbestos has subsided, decant 50 mils of the ethereal solution, representing 5 mils of the fluidextract. Completely extract the alkaloids from this solution by repeatedly shaking out with weak sulphuric acid. Collect the acid washings in a separator, add ammonia water until the solution is decidedly alkaline to litmus, and completely extract the alkaloids by repeatedly shaking out with ether. Evaporate the combined ether washings to dryness at a temperature not exceeding 60° C. Dissolve the alkaloid in 10 mils of tenth normal sulphuric acid V. S. and titrate excess of acid with fiftieth normal potassium hydroxide V. S., cochineal or methyl red being used as indicator. Each mil of tenth normal sulphuric acid V. S. consumed corresponds to 24 milligrammes of alkaloids of ipecac.

With asbestos it was found unnecessary to add the usual 10 or 15 Cc. water to cause balling of the mass before decanting an aliquot portion, thus a possible source of error is eliminated.

The temperatures stated in the above method should be included in assay, as it has been shown that ipecac alkaloids are prone to decomposition at higher temperatures.

This method may be applied equally well to Fluidextract of Cinchona.

COCAINE HYDROCHLORIDE.

The present Pharmacopoeia does not give a purity rubric for this chemical, with the consequence that a product varying in purity is found in the market.

The valuation of this chemical is, however, often carried out, either by assay or by determination of the melting point. In the former case it may be assayed either by shaking out with immiscible solvents or by direct titration with tenth normal silver nitrate V. S.

Depending upon whether chloroform or ether be used as an immiscible solvent, the results obtained are variable, and confusion often arises which could be avoided if an official method was provided.

The melting point of this chemical is also often disputed. The Pharmacopoeia gives the melting point between 183° C.–191° C., while it is held by some that pure Cocaine Hydrochloride has a melting point nearer 200° C.

It has been found that considerable variation of the melting point may be due to[1] manner in which this is determined, a long constant heat giving a much lower melting point than that found when material is introduced after a temperature within a few degrees of the accepted melting point is first obtained.

For the above reasons it would seem desirable that the new Pharmacopoeia establish an official assay process and determine whether or not the present melting point is correct.

CRESOL.

Under the description of this chemical is found a statement that it is soluble, one mil in about 50 mils of water usually forming a cloudy solution. This statement is very elastic and might be stretched to cover the present trade article,

[1] *Chem. Abstracts*, Vol. XIII, 22, p. 2971.

but if it be applied rigidly it is found that it is not soluble in 50 mils, and only in rare instances is a sample found to be soluble in 100 mils of water.

In the same monograph a statement is made that a solution of 1 mil of cresol in 60 mils of water is not more than slightly turbid, which is obviously incorrect if we are first unable to dissolve 1 mil cresol in 100 mils of water.

It seems that these tests are not correct indexes of the purity of present day product, and if these are too high, should be changed.

SOLUTION CRESOL COMPOUND.

The Insecticide Act provides that this preparation must bear a statement as to content of inert ingredients, principally confined to water, for which a process of assay should be appended.

The following process as recommended by W. W. Davies (JOURNAL A. PH. A. Vol. VI, p. 880), has been found to give reliable and concordant results.

By distillation of the solution with an equal volume of xylol through a dry condenser and collecting the distillate in a graduated cylinder, the water content may be read off directly.

TEST FOR METHYL ALCOHOL IN ETHYL ALCOHOL.

The present method for detection of methyl alcohol in ethyl alcohol is not satisfactory; in many cases a positive reaction is obtained, when applied to an alcohol of known purity.

Any one of several well-known tests for this impurity might be substituted for this test with better results, or the present test might be revised, bearing in mind that purity of fuchsin used may be one of the disturbing factors.

Much of the fuchsin now in the market is not pure. The writer has found samples of this chemical to contain in one case 85% sugar and in another case 50% of sodium chloride.

COPAIBA.

Under the tests for this oleoresin the statement is made, that, "after heating and the volatile oil has been driven off, a hard and brittle resin remains," which would seem to indicate that, if such a brittle mass was not obtained, it was not true specimen, when, as a matter of fact, several samples of accepted article yield a semi-solid resinous mass.

Another test under this oleoresin states, that "3 or 4 drops of volatile oil obtained by distillation with steam, when dissolved in 3 mils of glacial acetic and to which is added one drop of sodium nitrite T. S., and underlaid with 2 mils of sulphuric acid, shall not give a pink coloration to the acetic layer, indicating absence of Gurjun balsam."

This test is not reliable and often the pure article gives a positive reaction for this impurity.

OLEORESIN OF ASPIDIUM.

The quality and strength of this preparation is subject to considerable variation. Samples have been found to assay from 8% to 26% of filicin or filicic acid. Such a condition may be attributed to the fact that no assay is required for it.

The preparation is, however, often assayed by one of several methods; possibly the most used method is that of the Swiss Pharmacopoeia, which gives a fairly reliable index to crude filicic acid content.

Whether or not this method is a true index to its quality, or whether an assay for pure filicic acid should be devised, the writer is not prepared to state, but it would seem desirable to have a standard for this preparation, in order to secure a more reliable product.

ASSAY OF OPIUM AND ITS PREPARATIONS.

The present U. S. P. directions for assay read: Collect morphine crystals on a pledget of cotton in the neck of funnel.

In many cases the crystals obtained are so small that they pass through cotton and are lost, and the results vitiated.

A substitute for cotton is offered in the form of an Alundum or Gooch crucible; with the aid of suction either will retain all of the precipitate. By this method the morphine crystals may be weighed, thus providing a check on the volumetric titration.

A porous crucible of this type is even more suitable than filter paper, which is liable to rupture if suction is used. This is quite necessary when a slower filtering medium than cotton is used, else the rapid evaporation of ether leaves behind some of ether-soluble alkaloids, which would, of course, give higher results.

ABSTRACT OF DISCUSSION.

J. P. Snyder has used the method of Lyman F. Kebler for assaying Aromatic Spirit of Ammonia, with success. (See p. 615, July, 1917, THIS JOURNAL.—Editor.)

L. E. Warren regretted that the Pharmacopoeia gave the melting point for any of the alkaloids, because this is not definite for any of them.

Responding to a question of Arno Viehoever relative to Mr. Berg's view relative to assay of opium, the latter stated that his views coincided with those of H. W. Jones. (See January, 1920, JOURNAL A. PH. A., p. 51.) The use of filter paper is not satisfactory, owing to the slow filtration, he said. L. F. Kebler opposed the use of oak sawdust, he had found sand much more satisfactory. He contended that Mr. Berg's criticism of the assay of copaiba was not well taken, that it was almost impossible to obtain pure copaiba at present.

E. H. Grant stated that there was now very little, if any, copaiba imported, which would meet all the requirements of the United States Pharmacopoeia.

Mr. Berg stated that the sample of copaiba used in his work was passed by the Bureau of Chemistry. But that did not necessarily mean that they had erred—as he realized that they must often admit samples such as this which it is impossible t› obtain in absolute purity. Mr. Kebler's correction as to quality of commercial Balsam Copaiba is accepted.

ASSAY OF AROMATIC SULPHURIC ACID.*

BY E. F. KELLY AND J. C. KRANTZ, JR.

Having occasion recently to examine a commercial sample of Aromatic Sulphuric Acid, the writers employed the method suggested in an article published in 1916 by the Maryland State Board of Health. This article criticized the Pharmacopoeial method of assay on the ground that the boiling for six hours of the water and acid mixture in a flask connected with a reflux condenser prevented the decomposition of the acid ethyl suphate through the constant return of the alcohol to the solution instead of its removal. The modification suggested was to heat the mixture of aromatic sulphuric acid and water in an open beaker on a water-bath from three and a half to four hours. By this method, three assays

*Read before Section on Practical Pharmacy and Dispensing, A. Ph. A., City of Washington meeting, 1920.

showed only 14.9 percent of sulphuric acid. Two assays of the sample were then made by the Pharmacopoeial method and showed 18.4 and 18.5 percent, respectively, of sulphuric acid, indicating that the ester was not reformed to any considerable extent by the condensation of the alcoholic vapors.

In view of these varying results, a standard aromatic sulphuric acid was made from a strictly U. S. P. Sulphuric Acid, the calculated strength of the finished preparation being 20.49 percent of acid. An open beaker assay of this standard preparation with six hours' heating gave only 16.3 percent of acid. Three assays by the Pharmacopoeial method gave 17.8 percent of acid. Increasing the time of boiling from six to seven hours, three assays gave 17.2, 18.7, and 18.81 percent, respectively, of acid. Increasing the amount of water used for dilution from 60 to 120 mils had no effect upon the decomposition of the ester, the results of three assays being 17.2, 17.1 and 18 percent, respectively, of acid. These results indicate that the fault lies with the methods tried.

The next method employed contemplated the decomposition of the ester by concentrated hydrochloric acid, with the formation of ethyl chloride, and the determination of the sulphuric acid gravimetrically as barium sulphate. The hydrochloric acid did not decompose the ester, however, the soluble barium ethyl sulphate passed through the filter, and the amount of barium sulphate obtained, calculated as sulphuric acid, evidently corresponded only to the amount of free sulphuric acid present in the preparation.

We next attempted to saponify the ester by the usual method of adding an excess of standardized alkali hydroxide solution, heating on a boiling water bath for six hours and titrating the excess of alkali with standardized acid solutions. Three determinations showed only 14.4, 14.5 and 14.9 percent, respectively, of sulphuric acid.

The method finally adopted, and which yielded very satisfactory results, was to evaporate a weighed quantity of the aromatic sulphuric acid to dryness in the presence of an excess of standard alkali, and titrating the excess of alkali with a standard acid solution. The results obtained by this method were very concordant and the percents of acid corresponded closely to the amount present in the preparation. A series of five determinations showed the following percents of acid calculated as sulphuric: 20.47, 20.39, 20.39, 20.47 and 20.31. The advantage of this method, in addition to its being strictly quantitative, is the short period of time required to carry it out. In this laboratory, 45 minutes was sufficient to complete the assay.

The writers suggest that the present Pharmacopoeial method of assay for aromatic sulphuric acid be modified as follows:

Accurately weigh about 5 mils of aromatic sulphuric acid and transfer to a tall beaker. Add 30 mils of normal sodium hydroxide and evaporate the mixture to complete dryness on a sand bath. Dissolve the residue in 20 mils of distilled water and titrate the excess of alkali with normal sulphuric acid-methyl orange T. S. as indicator. Each mil of normal sodium hydroxide used corresponds to 0.049045 Gm. H_2SO_4.

Since all alkali solutions absorb a small amount of carbon dioxide when evaporated over an open flame, we wish to caution against the use of phenolphthalein as an indicator unless the titration is carried on at boiling temperature.

METHODS FOR THE CHEMICAL AND BACTERIOLOGICAL EXAMINATION OF ICE-CREAM.*

BY JOSEPH L. MAYER.

The increased consumption of ice-cream, due to prohibition, will result in regulations, where none now exist, with reference to the fat and bacterial content of this product; therefore, the subject of the chemical and bacteriological examination of ice-cream is of sufficient importance to present the following simple methods of analysis. For routine work, the following is a very satisfactory method for the quantitative determination of fat:

QUANTITATIVE DETERMINATION OF FAT.

Accurately weigh 9 grammes of the melted and thoroughly mixed sample into a Babcock milk-bottle, add 10 Cc. glacial acetic acid, follow with 10 Cc. sulphuric acid, sp. gr. 1.84, and after mixing thoroughly by a rotary motion allow to stand for at least five minutes. Then place in the centrifuge and whirl for eight minutes, after which add hot water up to the neck of the bottle and whirl for five minutes. Then take the bottles out of the machine and place in hot water for about ten minutes, and after returning to the machine whirl for three minutes and then, by means of calipers, read the percentage of fat on the neck of the bottle; multiplying this reading by two gives the percentage of fat in the sample.

This is a simple method, is inexpensive to operate, and yields accurate results when applied to vanilla ice-cream. For chocolate, strawberry and other kinds of ice-cream the method does not work so well, and for these samples employ the Roese-Gottlieb method for determining fat in condensed and evaporated milk, and apply it to ice-cream as follows:

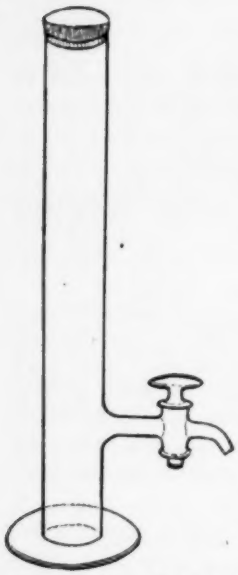
Accurately weigh about 4 grammes of the homogeneous sample into a Rohrig tube or similar apparatus, dilute with water to about 10.5 Cc., add 1.25 Cc. of concentrated ammonium hydroxide (2 Cc., if the sample is sour) and mix thoroughly. Add 10 Cc. of 95% alcohol and mix well. The total volume of liquid in the tube should now be somewhat less than 22 Cc. and be slightly below the stop-cock. Now add 25 Cc. of washed ethyl ether and shake vigorously for half a minute, then 25 Cc. of petroleum ether (redistilled slowly at a temperature below 60° C., preferably, and shake again for half a minute. Let stand 20 minutes, or until the upper liquid is practically clear and its lower level constant. Draw off as much as possible of the ethereal fat-solution (usually 0.5 to 0.8 Cc. will be left) into a weighed flask.

Reëxtract the liquid remaining in the tube, this time with only 15 Cc. of each ether, shaking vigorously half a minute, with each, and allow to settle. Draw off the clear solution into the same flask as before and wash the tip of spigot, the funnel, and the filter with a few cubic centimeters of a mixture of the two ethers in equal parts (previously mixed and free from deposited water). For absolutely exact results the reëxtraction must be repeated. This third reëxtraction yields usually not more than about a milligramme of fat, if the previous ether-fat solutions have been drawn off closely, an amount averaging about 0.02 percent on a 4-gramme charge. Evaporate the ether slowly over a steam pipe or electric hot plate, then dry the fat at 100° C. until loss of weight ceases. Prove the purity of the fat by dissolving in a little petroleum ether. Should a residue remain, wash the fat out completely with petroleum ether, dry the residue, weigh and deduct the weight. (This should not often be necessary.) Finally deduct the weight obtained by blank determination on the chemicals used.

This method leaves little to be desired with reference to accuracy. The tube employed by us for the extraction is on a glass foot and has the following dimensions: One inch in diameter, total length $9^1/_2$ inches, $1^{10}/_{16}$ inches from the base to the lower part of stop-cock, and holds about 22 Cc. from the base to the

* Read before the New York State Pharmaceutical Association, June, 1920.

lower part of the stop-cock, thus allowing the ethers to be drawn off without disturbing the lower layer. This is much shorter and wider than the usual apparatus employed, and has the advantage that during the shaking it can conveniently be held under running water, and thus the solvents are prevented from becoming overheated. Any chemical apparatus house will make these tubes to order at a nominal cost. We employ this method and apparatus for quantitatively determining fat in emulsions, etc.



Extraction Tube for Quantitative Determination of Fat in Ice-Cream.

BACTERIOLOGICAL EXAMINATION.

The samples of ice-cream are collected in 4-ounce, wide-mouthed, glass-stoppered, sterilized bottles, and the material allowed to liquefy in the containers; after which 1 Cc. is placed, by means of a sterile pipette, in 99 Cc. of sterile water and, after shaking thoroughly, 1 Cc. of this dilution is added to another 99 Cc. of sterile water. This makes a dilution of 1 to 10,000. After shaking the bottle thoroughly add $^1/_{10}$ Cc. of this dilution to one Petri dish and 1 Cc. to another Petri dish. To each dish add about 10 Cc. liquefied agar, at a temperature of about 45° C., and after mixing by a rotary motion, allow to harden and then place in an incubator at 37° C. for 48 hours, after which count the colonies with a lens, magnifying $2^1/_2$ diameters, or what the opticians call a $3^1/_2x$ lens. The number of colonies in the dish, when 1 Cc. is employed, is multiplied by 10,000, and in the case of the 1 Cc. by a 100,000 to obtain the number of bacteria per Cc. of ice-cream.

The agar is made according to the "Standard Methods of Bacteriological Analysis of Milk," reprinted from *American Journal of Public Health*. This publication may be obtained for a few cents by writing to 126 Massachusetts Ave., Boston, Mass. Methods with reference to the sterilization of apparatus, etc., given are followed.

We incubate the plates in a Freas electric incubator, which maintains a constant temperature of 37° C. For convenience we employ an autoclave with 15 pounds' steam pressure in preparing our culture media. An Arnold sterilizer gives equally good results, but possesses the disadvantage that by its use three successive days are required to sterilize the media. Glassware, collecting apparatus, etc., are sterilized by dry heat for one hour at a temperature of about 175° C. Dilutions are made in 4-oz. French square bottles using non-absorbent cotton as plugs.

The above methods for the quantitative determination of fat and bacteria in ice-cream are simple and accurate.

RESEARCH AND ANALYTICAL LABORATORIES,
LOUIS K. LIGGETT COMPANY.

COMMERCIAL HYDRASTIS (GOLDENSEAL).*

BY ARNO VIEHOEVER.

Hydrastis is defined by the United States Pharmacopoeia as "the dried rhizome and roots of *Hydrastis canadensis* L.) (Fam. *Ranunculaceae*) without the presence or admixture of more than 2 percent of the stems, leaves or other foreign matter and yielding not less than 2.5 percent of the ether soluble alkaloids of Hydrastis." From this definition and standard one should expect to find on the market a drug which is not only up to the alkaloid standard but also quite free from foreign matter.

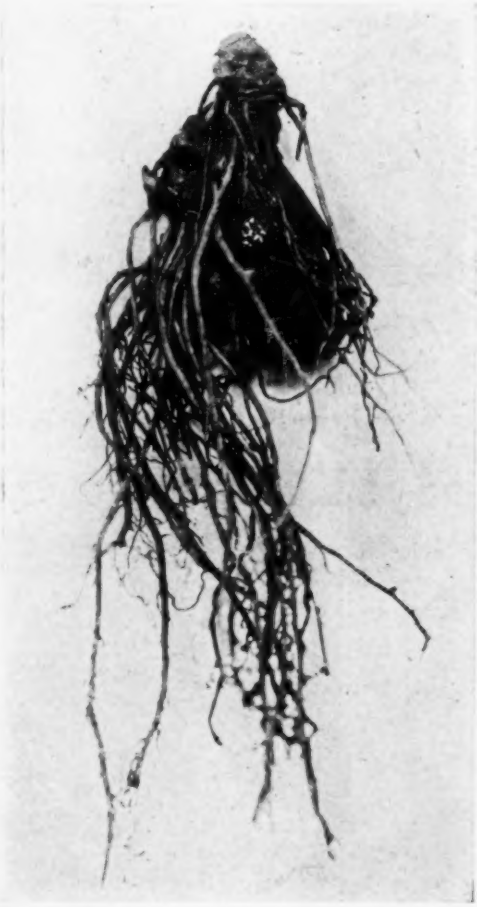


FIG. 1.—Mature rhizome of *Hydrastis* with roots, showing habit of growth. × 1. (After Van Fleet.)

In continuation of the Bureau's policy to extend the drug inspection from the imported drugs also to domestic drugs,[1] samples of Hydrastis were collected in the different states of the Union in the years 1917 and 1918. Hydrastis is certainly one of the most important domestic drugs, and, as is well known, is exported to a very considerable extent. Since it is a very expensive drug, its price per pound now being $5.70–$5.80 for the whole drug, and $6.50–$6.75 for the powdered drug,[2] it is especially important that it should come fully up to the standard. The samples were examined with regard to moisture, alkaloid content, total ash, and acid-insoluble ash. With the exception of one very small sample, in which the alkaloids could not be determined, the determinations indicated were carried out on all samples.

A few samples of known origin were also obtained, to ascertain, aside from the amount of alkaloid present, the amount of total and acid-insoluble ash in samples which had been carefully collected and specially washed after collecting. In one instance the material was dried at room temperature, in the other at temperatures rising up to 110° C.

The material was separated into rhizomes and roots and the determinations made on the separate parts. The results are tabulated below:

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* Read before Scientific Section, A. Ph. A., City of Washington meeting, 1920.

[1] A. Viehoever, C. O. Ewing and J. F. Clevenger, "Commercial Viburnum Barks and Preparations," THIS JOURNAL, 7, No. 11, 944–952, 1918.

[2] *Drug and Chemical Market*, 7, 658, April 7, 1920.

TABLE I.—EXAMINATION OF COMMERCIAL SAMPLES OF HYDRASTIS (GOLDENSEAL).

No.	Condition. Whole Rhizome.	Foreign Matter: Vegetable. Stems. %	Foreign Matter: Vegetable. Stems and Leaves. %	Foreign Matter: Mineral. %	Moisture. %	Ether soluble Alkaloids. %	Ash. Total. %	Ash. Acid insoluble. %	Analysts.[2]	Quality.	Remarks.
1	Whole root (Rhizome)	...	...	.....	9.57	3.70	4.87	1.27	Woodruff	Good	.....
2	Abundant roots	...	...	.....	9.11	3.88	5.25	1.30	Zufall and Millner	Good	.....
3	Thick rhizome; has small amount of roots	...	...	.....	7.92	(2.24) 2.42	4.49	1.34	Glycart	Good	Deficient in alkaloids
4	Partially broken; pieces of rhizome 61.7%; rootlets and short pieces 35.5%	...	2.8	Sand and clay[1]	4.89	3.76	6.16	1.68	Wichmann	Fair	Excessive foreign vegetable matter
5	Abundant roots; small rhizomes	...	...	.....	8.55	2.84	6.72	1.80	Glycart	Fair	.....
6	Rhizomes and roots, whole	...	...	.....	...	(2.70) (2.69)	5.4	1.80	Clevenger Viehoever	Fair	Fairly clean
7	Rhizomes and roots, whole	...	...	.....	...	..	6.4	1.90	Clevenger	Fair	Fairly clean
8	Rhizomes, roots	...	...	.....	7.72	(3.54) 3.74	6.46	2.09	Glycart	Fair	.....
9	Abundant roots, less rhizomes	2.0	...	.....	8.45	(4.24) 4.31	6.72	2.10	Glycart	Fair	.....
10	Probably whole root	...	...	.....	10.27	4.72	6.25	2.45	Zufall and Millner	...	.....
11	Rhizomes and roots	...	About 0.5	.....	...	2.90	7.14	2.64	Harrison	...	Considerable soil present
12	Probably whole root	...	...	.....	8.15	Sample too small	7.11	2.90	Kuh	...	.....
13	Probably whole root	...	...	.....	7.90	4.64	8.35	3.45	Zufall and Millner	...	Excessive mineral matter
14	Probably whole root	...	...	.....	9.16	3.86	8.00	3.65	Zufall and Millner	...	Excessive mineral matter
15	Rhizomes and roots; coarsely broken	0.5	...	.....	6.95	3.58	10.16	5.00	Glycart	...	Excessive mineral matter
16	Probably whole root	...	...	.....	9.72	4.16	9.70	5.10	Zufall and Millner	...	Excessive mineral matter
17	Rhizomes, broken	...	Trace	.....	8.95	(2.28) 2.30	10.65	5.95	Eaton	...	Deficient in alkaloids; excessive mineral matter
18	Probably whole root	...	...	.....	...	2.43	(13.35)	(9.1)	Zufall and Grant	...	Shipment held for export

[1] Dried *in vacuo* at 70° C. [2] All from U. S. Department of Agriculture, Bureau of Chemistry

Powdered Rhizomes

1 Powdered ... 14.8 10.5

	Powdered Rhizomes					14.8	10.5			
1	Powdered	...	...	.....	9.60	3.23	8.67	3.67	Grant	... Excessive mineral matter
2	Powdered	...	...	Sand	9.86	2.90	11.03	4.83	Woodruff	... Excessive mineral matter
3	Powdered	...	...	Sand	...	3.0	10.28	5.08	Calloway	... Excessive mineral matter
4	Powdered	...	...	.....	5.88	2.69	11.49	5.63	Glycart	... Excessive mineral matter
5	Powdered	...	...	Sand and clay	4.30[1]	2.70	11.30	6.61	Wichmann	... Excessive mineral matter
6	Powdered	...	...	Sand and clay	5.12[1]	2.32	12.07	6.67	Wichmann	... Deficient in alkaloids; excessive mineral matter, and so forth
7	Powdered	...	...	Sand	9.00	2.85	12.26	6.67	Woodruff	... Excessive mineral matter
8	Powdered	...	Trace	.....	8.05	2.64	12.15	7.05	Eaton	... Excessive mineral matter
9	Powdered	...	Trace	.....	8.85	2.44	12.54	7.20	Eaton	... Excessive mineral matter
10	Powdered	...	...	.....	6.07	2.51	14.71	8.25	Glycart	... Excessive mineral matter
11	Powdered	...	...	.....	...	2.62	13.01	8.31	Grant	... Excessive soil
12	Powdered	...	...	.....	...	1.15	15.50	10.00 (sand)	Murray	... Consists largely of roots
13	Powdered	...	...	Sand	8.72	2.64	17.81	11.22	Woodruff	... Excessive mineral matter
14	Powdered	...	...	.....	...	(1.74) 1.75	11.72	...	Grant	... Deficient in ether soluble alkaloids. Many hairs, which indicate much leaf

TABLE II.—EXAMINATION OF AUTHENTIC SAMPLES OF HYDRASTIS (GOLDENSEAL).

Laboratory Number.	Sample. Part used.	Sample. Amount present. %	Ether Soluble Alkaloid. %	Ash. Total. %	Ash. Acid-insoluble. %	Analysts.	Remarks.
2089	Rhizome	82.5	3.38	4.7	1.4	J. F. Clevenger	.....
	Roots	17.5	2.36	9.4	3.4	J. F. Clevenger	.....
2886	Rhizome	51.6	3.90	5.6	2.6	J. F. Clevenger	6.9% moisture
	Roots	48.4	2.55	8.3	3.3	J. F. Clevenger	6.8% moisture
2913	Rhizome	59.4	3.88	6.2	1.5	A. Viehoever and J. F. Clevenger	.....
	Roots	40.6	2.15	9.5	2.9	A. Viehoever and J. F. Clevenger	.....

DISCUSSION OF RESULTS.

Alkaloid Content.—The data in Tables I and II show an amount of alkaloids present, which, with the exception of a few samples, exceeds the minimum required by the U. S. P. limit of tolerance. Even where the amount found is less than 2.50 percent, the differences are not great.

This finding agrees with the report in the literature[1] that authentic samples of hydrastis usually contain materially more alkaloid than is required by the U. S. P. limit of tolerance. Of particular interest is the finding of this difference in alkaloid content of root and rhizome. LaWall[2] had already pointed out that he found 2.48 percent in a rhizome, while the roots contained only 1.38 percent, and concludes on the basis of the examination of this one sample: "Hydrastis rhizomes are between 1.5 and 2 times as rich in alkaloids as the rootlets." Our data show that there is indeed a difference in the alkaloid content, though it may be less than that found by LaWall.

That the amount of alkaloid may vary greatly between rhizomes and roots of the same plant material has been observed in other drugs. Bredemann, for instance,[3] reports that roots of White Hellebore (*Veratrum album* L.) in some cases were found richer, in other instances, poorer in alkaloids than the rhizomes. He points to the possible influence of time of collection and manner of drying upon the alkaloid content. At any rate, the following statement in the literature:[4] "This 'fiber' as it (mass of roots) is commercially termed, has equal medicinal value with the rootstock," is evidently too general. The further statement that the fiber realizes only about half the price when separated from the rootstock deserves special attention.

While no analytical data are included, the following statement by Lloyd[5] is of considerable interest:

"When the dried rhizome is kept from season to season, it gradually changes internally to brown, or greenish brown. This alteration commences at the surface and creeps inward, until after some years, by this form of decay, the yellow principles will have nearly perished, and the drug will have become proportionally of less value."

Since analytical data are lacking, it appears still undecided whether the drug harvested in the spring or in the fall contains more alkaloid. According to Dohme[6] "the spring root is better than the fall drug," and according to Henkel and Klugh[7]

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[1] Reports of Committee on Quality of Medicinal Products; Reports of Committee on Drug Market; Report of Penna. Ph. Association Committee on Drug Market, in THIS JOURNAL, "Digests of Comments on the Pharmacopoeia of the United States," etc.

[2] Charles H. LaWall, "Comparative Alkaloidal Strength of Hydrastis Rootlets and Rhizome," THIS JOURNAL, 1, 799, 1912.

[3] G. Bredemann, "Über die Alkaloide der Rhizome von *Veratrum album* und über die quantitative Bestimmung derselben," *Apotheker-Zeitung*, Nos. 5 and 6, 1906.

[4] Walter Van Fleet, "Goldenseal Under Cultivation," U. S. Department of Agriculture, *Farmer's Bulletin*, No. 613, 2.

[5] *Bulletin of the Lloyd Library*, No. 10, 76–184, 1884; *Hydrastis canadensis*, Goldenseal.

[6] A. R. L. Dohme, "How Drugs Vary in Strength and Quality," in *Apothecary*, 2, 942, 1905.

[7] Alice Henkel and G. Fred Klugh, "The Cultivation and Handling of Goldenseal," U. S. Department of Agriculture, Bureau of Plant Industry, *Circular* No. 6, 10, 1908.

"the root should be collected in the autumn after the plants have matured seed. Spring-dug root shrinks more in drying and always commands a lower price than the fall-dug root."

ASH CONTENT.

The cleanliness was only in a few instances that which could be considered desirable or of falling within the limit of 2 percent for foreign matter. While little foreign vegetable matter was observed, high amounts of total ash, and especially also of acid-insoluble ash, were found in all powdered samples, and such of the unground samples as were obviously dirty. The low amount of ash in samples which were clean, or fairly so, rather demonstrated that the natural content in mineral substances is by no means high. It is of interest in this connection that the Austrian (VIII, 1906), Swiss (IV, 1907), Italian (III, 1909), and Netherlands (IV, 1915) pharmacopoeias all have a standard limiting the amount of total ash to 6 percent. The British Pharmacopoeia alone has a higher standard, namely, 11 percent.

Among others, Riedel[1] reports samples of hydrastis having only 4.7–6.3 percent total, and 1.9 percent acid-insoluble ash. The data which we obtained with the separated parts of samples that had been washed and largely or wholly freed from adhering dirt, show conclusively, we think, the low natural content of mineral substance in the rhizomes as well as the roots. The roots appear to have a somewhat higher total and acid-insoluble ash than the rhizomes, though the samples examined are too few to make a general statement. In contrast to this low limit, the British Pharmacopoeia has a standard of 11 percent. The few samples which were clean gave an amount of ash which was either somewhat below 6 percent or occasionally slightly above the limit. When rhizomes and roots were examined separately it was evident that the rhizomes contained appreciably less than 6 percent, the roots appreciably more than 6 percent. The proportions of roots to rhizomes varied; in one sample we found roughly one-fifth roots, in another about equal parts. As the proportion of roots may reach 50 percent and possibly more, the ash standard should take the highest amount of ash in the roots into consideration. The limit of 6 percent, while possibly satisfactory for the rhizomes, appears to be too rigid for the roots. Since the roots contain considerable amounts of alkaloid, though probably at times less than the limit requirement, and since, furthermore, the root is admitted in the pharmacopoeias which have an ash limit for the drug, it is believed that a maximum value of 8 percent total ash would be more satisfactory than one of 6 percent. The standard of 11 percent, which the British Pharmacopoeia adopted, is believed to be too high, as our data show.

While it is conceded, from the habit of growth (see Fig. 1), that soil and sand are apt to adhere to the rhizome and roots and may not be easily removed when the drug is in the dried condition, there are useful devices which should prove of value in the cleaning[2]; furthermore, there seems to be no objection to the washing

[1] *Riedel's Berichte*, 1912, p. 50; from *Digest of Comments*, 1914, p. 308.

[2] C. H. Rogers and E. L. Newcomb, "A Method for Cleaning Digitalis, with a Study of the Inorganic Constituents," *Am. J. Pharm.*, 90, p. 239–252, 1918.

of the drug shortly after collection in order to remove the soil. In fact, Van Fleet,[1] speaking of digging and curing the cultivated roots, suggests this procedure:

"The rootstocks and attached rootlets are washed clean of all soil and freed from sticks, pebbles, or other foreign matter lodged in the fibrous masses."

CONCLUSIONS.

It appears clear that a maximum limit of tolerance of 8 percent for total ash would be quite liberal, and the adoption of such a tentative limit by this country, producing the drug for domestic use and for export, as stated, has therefore been proposed.[2] A tentative limit of 3.0 percent of acid-insoluble ash is also suggested as a fair maximum limit of tolerance.

The findings with regard to the alkaloid content also indicate that the alkaloid requirement could well be raised to 2.75 percent, if the drug were in a properly cleaned condition.

SUMMARY.

It has been shown that:

(1) The proportion of rhizome to roots varied considerably in the samples examined.

(2) The alkaloid content was found to be higher in the rhizomes than in the roots. A previous report in literature is thus confirmed.

(3) The raising of the required minimum alkaloid content to 2.75 percent of ether-soluble alkaloids is suggested.

(4) Samples collected in interstate trade, while containing sufficient alkaloid, as required by the United States Pharmacopoeia, contained rather generally amounts of mineral matter greatly in excess of that naturally present.

(5) The total and acid-insoluble ash in the roots was found to be higher than in the rhizomes.

(6) A maximum limit of 8 percent for total ash, and 3 percent for acid-insoluble ash is proposed.

PHARMACOGNOSY LABORATORY,
BUREAU OF CHEMISTRY.

PHARMACEUTICAL PROBLEMS PRESENTED BY THE DAKIN PRODUCTS.*

BY FRANK B. KIRBY, M. D.

Early in the World War it became evident that the economics of warfare demanded investigation of the problems of sepsis and antisepsis. Quick repair of wounds was a consideration of prime value as the return to the field of injured experts meant more for ultimate success and speedy victory than the training of recruit substitutes.

Attention was early drawn to the advantages presented by the hypochlorites and an investigating committee appointed under Col. E. F. Martin as chairman.

We shall pass the therapeutics of hypochlorites to emphasize the essential importance of using a calcium hypochlorite of known and definite free chlorine strength, as brought out by the fact that few if any products on the market could

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[1] Walter Van Fleet, "Goldenseal Under Cultivation," U. S. Department of Agriculture, *Farmer's Bulletin* No. 613, 12, 1914.

[2] C. O. Ewing and A. Viehoever, "Acid-Insoluble Ash Standards for Crude Drugs," THIS JOURNAL, 8, No. 9, p. 725–730, September 1919.

* Read before Scientific Section, A. Ph. A., City of Washington meeting, 1920.

be depended upon. So-called "chloride of lime" for household purposes may satisfy the purchaser but for the fine results demanded by an exacting army and navy we had to have something different. This, with the fact that oxidation of sodium salt is very rapid, makes necessary a titration of the original Dakin solution at least once in every 24 hours, as a variance of .1 of 1% in alkalinity makes for the difference between success and failure.

The standard, while not impossible to accurate pharmacy, is impraticable in the every-day drug store and even in hospital dispensaries.

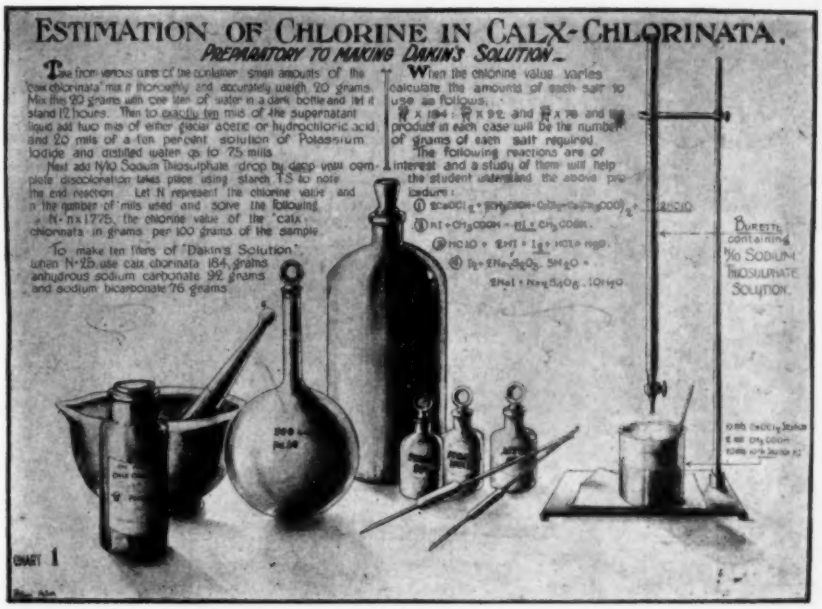
ESTIMATION OF CHLORINE IN CALX-CHLORINATA.
PREPARATORY TO MAKING DAKIN'S SOLUTION.
To make ten liters of "Dakin's Solution" when N=25 use calx chlorinata 184 grams anhydrous sodium carbonate 92 grams and sodium bicarbonate 76 grams
When the chlorine value varies calculate the amounts of each salt to use as follows:
The following reactions are of interest and a study of them will help the student understand the above procedure:
BURETTE containing N/10 SODIUM THIOSULPHATE SOLUTION.
CHART 1

PLATE 1.

Chiefly because of this consideration, but also because of others of a therapeutic character, Dakin was led to investigate the possibilities offered by the synthetic chloramines. These are chlorine combinations with nitrogen releasing the chlorine radical in the presence of albuminoids and other organic material somewhat more slowly than the hypochlorites. The chloramines are more stable than the hypochlorites but in solution must be protected from strong sunlight and organic matter. Aqueous solutions keep relatively well but with the facility of solution we find stock solution objectionable because of possible contamination and deterioration.

The third of the Dakin products for consideration by the committee referred to is the dichloramine-T. This differs in every way from the chloramine-T. Dichloramine-T is oil soluble and instantly destroyed by the action of water. Dakin's first solvent was a chlorinated eucalyptol, which solution was diluted with chlorinated paraffin oil. The inconveniences and cost of the double solvent led to further investigations which developed into what he calls chlorcosane.

The chloramines are effective because of the free chlorine available for action as a germicide. They meet the therapeutic problem effectively only when rightly

prepared, and considering the delicate character of the di-chloramine-T solution must be properly carried out.

The solvent chlorcosane is made by melting paraffin and saturating with chlorine, which adds one-half the weight, replacing some of the hydrogen, part of which is driven off as hydrochloric acid.

To maintain full clinical efficiency it is necessary that the dichloramine-T solvent be saturated with chlorine, otherwise this element is robbed from the dichloramine-T.

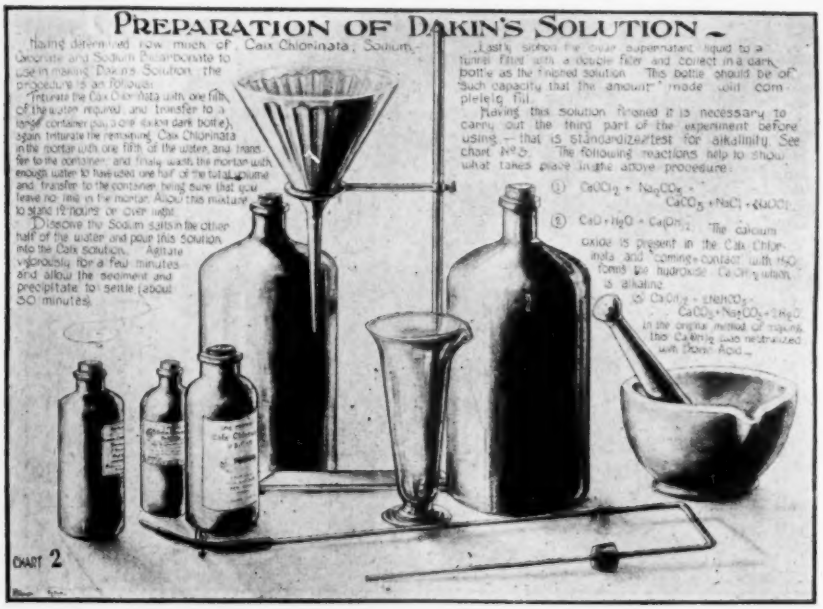

PLATE 2.

Solution is made by slight heat or a few drops of chloroform to be subsequently mixed with the chlorcosane. The dichloramine-T may be had in powder or tablet as preferred and must be protected from light, heat, chloroform, alcohol or organic matter.

For dispensing, solution must preferably be extemporaneous. Stock solutions will not do. Prescriptions should be filled in amber bottles, glass-stoppered, although if dispensed as it should be in, say, one-ounce bottles, a cork stopper has little disadvantage.

The reaction as to the chlorine loss has been accurately worked out, showing different losses for the various metals, wood, cotton and rubber, both hard and soft. Nothing but glass or porcelain should come in contact with dichloramine-T solution.

Unless the scientific work connect up with the commercial it has little value, and in presenting these facts it is with the intention to emphasize the necessity of presenting an accurate, full strength product for clinical use.

On this depends future business.

The commercial aspect of the problems presented is sufficient to warrant the care necessary, as three allied branches of applied medicine can and do make use of dichloramine-T. We refer to the general and special practice of human medicine and surgery, veterinary medical practise and veterinary surgery, and dentistry as well.

These are the channels of distribution and a well-made dichloramine-T solution is a subject on which the retail druggist should get a hearing from physicians, veterinarians and dentists who do not have the time, inclination or facilities for doing this work.

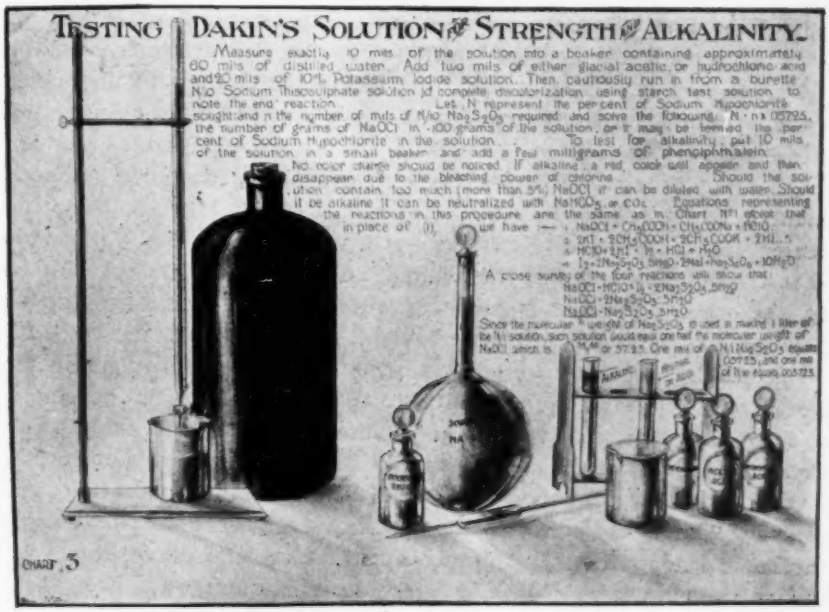
TESTING DAKIN'S SOLUTION & STRENGTH & ALKALINITY
Measure exactly 10 mils of the solution into a beaker containing approximately 80 mils of distilled water. Add two mils of either glacial acetic or hydrochloric acid and 20 mils of 10% Potassium Iodide solution. Then cautiously run in from a burette N/10 Sodium Thiosulphate solution till complete decolorization using starch test solution to note the end reaction.
Let N represent the percent of Sodium Hypochlorite sought and n the number of mils of N/10 $Na_2S_2O_3$ required and solve the following: N = n x .05725, the number of grams of NaOCl in 100 grams of the solution, or it may be termed the per cent of Sodium Hypochlorite in the solution.
To test for alkalinity, put 10 mils of the solution in a small beaker and add a few milligrams of phenolphthalein. No color change should be noticed. If alkaline a red color will appear and then disappear due to the bleaching power of chlorine. Should the solution contain too much (more than 5%) NaOCl it can be diluted with water. Should it be alkaline it can be neutralized with $NaHCO_3$ or CO_2. Equations representing the reactions in this procedure are the same as in Chart N°1 except that in place of (1) we have:—
a 2x1 + $2CH_3COOH$ + $2CH_3COOK$ + 2HI + 5
b + $HClO_3$ + 7HI = 3I + HCl + H_2O
= 5I + $2Na_2S_2O_3$ 5H$_2$O + 2NaI + $3Na_2S_4O_6$ + $10H_2O$
A close survey of the four reactions will show that:
NaOCl + HClO$_3$ + 4$Na_2S_2O_3$ 5H$_2$O
NaOCl + $2Na_2S_2O_3$ 5H$_2$O
NaOCl + $Na_2S_2O_3$ 5H$_2$O
Since the molecular weight of $Na_2S_2O_3$ is used a making 1 liter of the N/1 solution, such solution would equal one half the molecular weight of NaOCl which is 74.46 or 37.23. One mil of N/1 $Na_2S_2O_3$ equals .037225, and one mil of N/10 equals .003725
CHART 3

PLATE 3.

ABSTRACT OF DISCUSSION.

Albert Schneider inquired as to whether the average pharmacist was prepared to do the work necessary in connection with the preparation of Dakin's solution. William Gray stated that a solution of chlorinated lime, containing $4\frac{1}{2}$ percent chlorine, of which a 1–10 dilution could readily be prepared would keep without material loss for a year. Lieut. Kennedy, U. S. N., stated that they had considerable trouble with the keeping qualities of chlorine solution; it kept better in large volumes; he also asked for a ready, accurate method of titrating the solution. Charles M. Hallum stated that the control of alkalinity was as troublesome as of chlorine, and it was important to have that just right.

In answering the questions the author of the paper replied that pharmacists were equipped for making Dakin's solution. The difficulties are the factors brought out by others and which induced Dakin to investigate the chloramines. He did not know of any more rapid method than that usually employed; the solution must be titrated every 24 hours to insure a suitable product. He did not encourage the making of a stock solution; it is essential to have the dichloramine-T properly made, so that there is no precipitate, and no excess of acid.

Doctor Kirby called attention to three charts of the Navy Department for use of the pharmacists, for their guidance in making Dakin's solution. These were published in the *Supplement to the U. S. Naval Medical Bulletin*, of January, 1919. The editor acknowledges the courtesy of the loan of these cuts; they are used in connection with this article.

TABLET MANUFACTURE.*

BY ROBERT C. WHITE.[1]

The story of tablet making is indeed an interesting one. It possesses so many phases.

Medical Viewpoint.—Having been originated for the chief purpose of introducing to the human body medicinal ingredients some naturally think of it from a medical viewpoint. Such questions arise as to whether the various more or less soluble chemicals can be introduced into the body by this means. Some will always argue that medicine in solutions is preferable on account of its much more speedy absorption, while others pay special attention to the keeping quality of the various ingredients, and the convenience with which medicine in tablet form may be conveyed from place to place, or may be carried by the user himself, and how the layman has the medicine in properly subdivided doses for self-medication.

Mechanical Viewpoint.—The man of mechanical tendencies naturally thinks of the manufacture of medicinal tablets as one involving machinery and mechanical appliances for the proper powdering, the proper sub-dividing, moistening, drying, screening and compressing of material into tablet form. The various shapes of tablets, the different weights, the different colors involved, the raised lettering on some, the concave engraving on others; all of these processes are much affected by temperature, humidity, exposure to light, and to foreign particles, etc.

Viewpoint of Pharmaceutical Chemist.—The pharmaceutical chemist will, of course, give attention to the solubility, to the preservation, and keeping qualities of tablets, the color reaction, the deliquescent tablets, the tablets of volatile ingredients, the tablets made for speedy disintegration, for absorption in the stomach, or for absorption in the intestinal tract; the man, in other words, whose viewpoint is controlled by the need of the physician and by the possibility of mechanical adaptations. Thus we find that tablet making involves a wider field than most of us think when first considering the subject.

Origin.—Tablet making was first begun in England about sixty-eight years ago. The writer has never been able to find any very definite information as to who the first tablet maker may have been, but doubtless the idea originated from the association of lozenges and of pills, which were well known before that time. Tablets as originally designed were simply intended to bring together such dry medicinal ingredients as might be compressed into small discs. In fact this new form was improperly called "compressed pill." Pills, as we all know, are really made from the plastic mass, combining the various ingredients.

Difference between Tablets and Pills.—The idea of compressed pills, however, is not as erroneous to-day as it was fifty years ago; because to the great list of simple compressed chemicals, or list of dried chemicals, has since that time been added the combination of granulated masses containing solid or semi-solid vegetable extractives, which during the process of admixture were really plastic matter similar to the original pill masses. In other words, the tablet masses of to-day contain practically all formulae which may be found in pill combination. We

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* Read before Philadelphia Branch, A. Ph. A.. May meeting, 1920.

[1] Pharmaceutical Engineer.

need not here concern ourselves as to whether medicinal ingredients given in tablet or pillular form are best from a physiologic standpoint. This argument will continue to go on for years to come, and the writer's only comment to this discussion is that a competent tablet manufacturer can make practically any tablet from any formula that can be made in pill form which will disintegrate as readily in the fluids of the stomach as will any pill that the best pill maker may turn out. Great objection was at first made, and justly so, to tablets on account of their sparing solubility, the great length of time necessary for disintegration, all of which was readily proved by the fact that many tablets as made during the first thirty years of tablet history would pass through the human system showing as much change as would a glass marble. This, of course, gave great opportunity to the manufacturers who had installed expensive pill machinery, and who had worked out very proper pill formulae, to justly ridicule the idea of compressing dry ingredients into any useful form of medication. Since tablet-making has become a science, however, these objections are by no means sustained, and, as all manufacturers realize, the number of tablets manufactured greatly exceeds that of pills. The retail druggist, of course, has occasion to manufacture pills upon prescription, but practically never finds himself in the position where he has to manufacture tablets, although there are on the market two or three small mechanical devices which will permit the druggist to manufacture tablets of fair accuracy.

TABLET MANUFACTURE.

Upon investigation the writer finds that during his sad connection with the fraternity of the mortar and pestle he has been involved in the manufacture of over thirty-four hundred different formulae for compressed tablets. It is, therefore, obvious that in this paper we can go into no detail giving working formulae for the manufacture of various kinds of tablets. These will, therefore, have to be treated in classes. Suffice it to say no tablets of different formulae are ever the same in every detail of manufacture, but on account of the similarity of some, they may be grouped under similar processes. Tablets as a rule are lenticular-shaped discs from four to ten times as wide as they are deep. This shape proves convenient for tablets, either designed to be swallowed or dissolved in the mouth, as they lie comfortably on the tongue. The same ingredients can easily be made in varying weights, thus permitting a wide range of medication according to the age and condition of the patient. The majority of tablets will not disintegrate in the mouth, but can be quickly swallowed, and are thus a most useful form of medication on account of their tastelessness. Tablets as a class possess great keeping qualities. On account of the moisture present in the plastic mass, pills, unless heavily coated, frequently dry out and crack, thus destroying the perfect finish of the pill.

Mechanical Methods.—The three parts of a compressing machine which come in contact with the ingredients to form a tablet are the upper punch, the lower punch, and the die into which these punches are thrust by mechanical means. In other words, the tablet is formed by pressure on the ingredients between two punches restricted in expansion by the surrounding die. Standard sizes of punches and corresponding dies are well known in sizes from $^1/_{32}$ to 1 inch in diameter, and when the tablets do not require coating they are usually made standard cup, *i. e.*, of a known concavity.

For coating a deeper cup is used as this gives the tablet a more spherical outline, which permits of the tablets rolling more uniformly in the coating basin. Punches and dies can be so made as to give almost any shaped tablet. Many

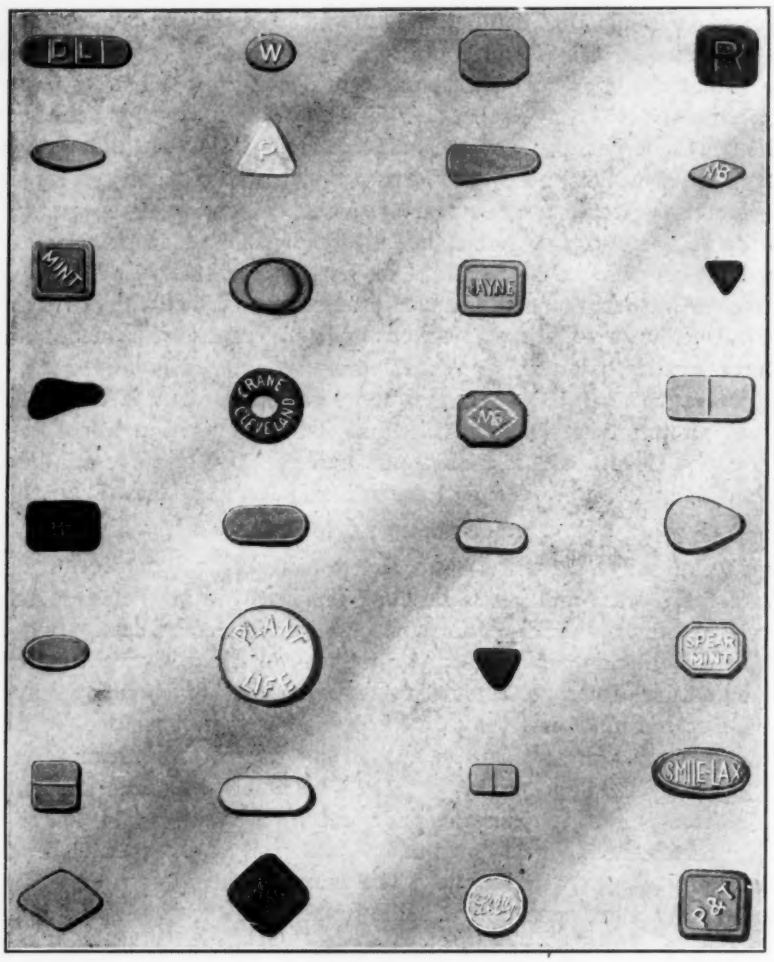

Fig. I.—Special Shape Punches and Dies.

manufacturers of certain specialties often adopt "freak" shapes for their tablets on account of the individuality their product derives, but many shapes are both useful and ingenious, to wit, the coffin-shaped bichloride tablet, the life-buoy shaped "Life Saver" mints and many others. It would be well to fix firmly in mind at the present time that fine powders cannot be compressed into tablets. This is for the simple reason that the air which feeds into the die with the ingredients, on account of the tight fit of the punches and the die, cannot escape when the blow is struck; whereas the use of granules permits the air to escape more gradually on account of the interstices formed due to these irregular particles. This rule, therefore, gives the manufacturer considerable difficulty in that, in the ma-

jority of cases, granules have to be built up from the fine powdered ingredients involved. This necessitates the use of considerable machinery and an excipient or binder.

Simple Salts for Granulation.—There are certain chemicals that in their original form can be readily used for tablet making. These include the iodides, bromides and chlorides, of such salts as potassium, sodium and ammonium. Potassium bicarbonate, potassium permanganate, sodium phosphate, zinc sulphate, and even sugar can be compressed in this simple way, if they are reduced to a size which will pass through a number twenty screen, but not through a number thirty. This eliminates fine powder. These salts can be readily bought in crystal form, and ground to sizes between a twenty- and thirty-granule, which can be

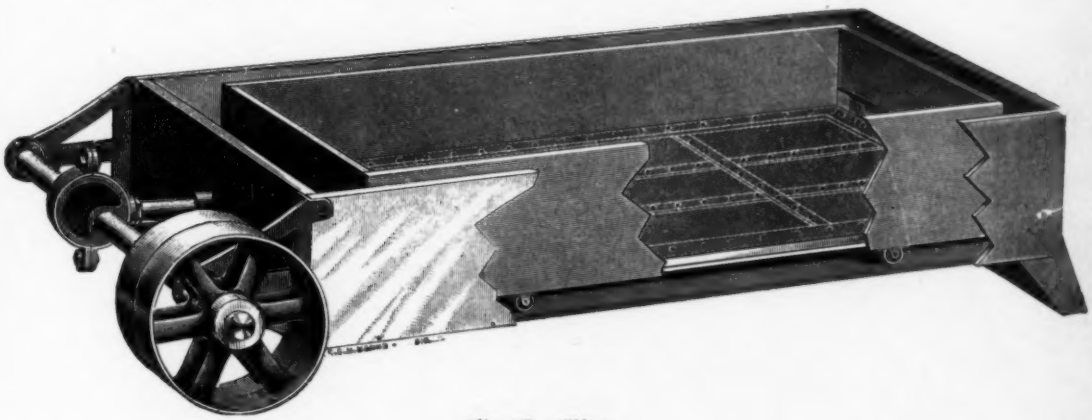

Fig. II.—Sifter.

fed direct into the hopper of a compressing machine. It is necessary, however, to exercise care in the case of some of these single salts that all surface moisture be removed though none of the water of crystallization must be disturbed, otherwise the chemical content of the tablet will vary. Mixed ingredients give a great deal more trouble not only from the incompatibility involved, but from the mechanical manipulation necessary for the uniform distribution of the various ingredients through the entire mass.

Mixed Salts.—It might appear at this stage that if we can compress a simple granulated salt, we should be able to mix two or more of these salts together in the proper proportions, and make from them uniform tablets. This is not the case in ground crystals as it will be found that all crystals fracture differently. Thus in ground salts we will find that one will contain more fine particles than will another, and these will not feed evenly into the die. This will be readily demonstrated if you will examine a tablet the appearance of which is *mottled*. On account of containing certain colored ingredients, one side of this tablet will be prominently mottled while the other side of this tablet will be colored more evenly. This is due to the fact that although only a ninetieth or hundredth of a second is necessary for the compression of the tablet the fine particles fall onto the surface of the lower punch while the coarser particles remain on the top. If you will stand by a tablet machine, and lift the tablet as it comes from the die plate, you will see that the lower side of a tablet is always smoother, if colored ingredients

are involved, than the upper. If practiced on dry mixed ingredients the results would unquestionably be that some tablets would contain more of some ingredients than others, so that in the vast majority of cases it is necessary for the manufacturer to reduce all the ingredients to an impalpable powder, place these in a

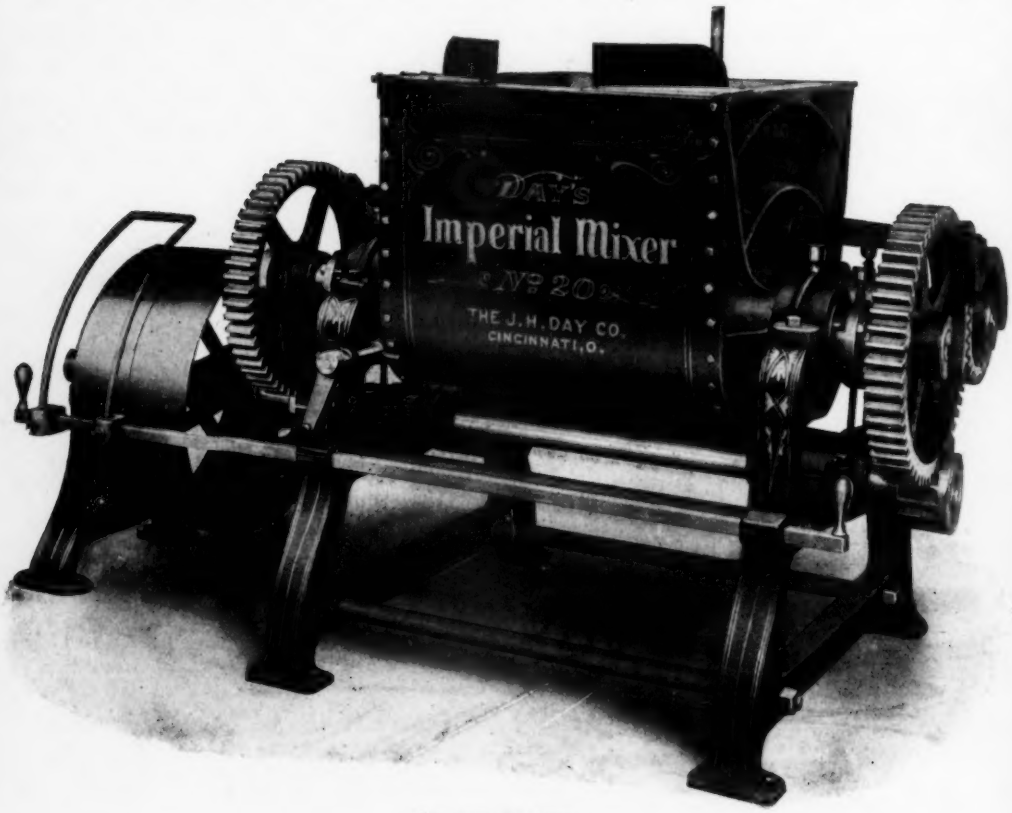

Fig. III.—Mixer.

heavy mixer, and by the use of various excipients reduce the combination to a uniform mass.

Mixing of the Mass.—It will be here found that just as in making fluid mixtures the various ingredients must be fed into the mass in proper sequence with due regard to both chemical and physical reaction. In all cases before putting ingredients into a mixture for the making of a mass all potent remedies should be very carefully forced through a silk sieve, and to accomplish this, in the majority of cases, a ball mill should be used for the powdering of the ingredients.

Mixers.—Many types of mixers are necessary for the purpose of the manufacturer. They come chiefly in two classes, those for mixing dry powders, which usually have screening apparatus attached, and those for mixing heavy plastic masses. An entire book could very easily be written on the subject of mixers. Those for the plastic mass of necessity have very powerful drives, and require very strong transmission. Those with a single set of beaters, or blades, are not sufficiently strong for the sticky masses, as the mass will collect on the blades and turn

over in its entirety without doing any real mixing. For this reason those having two sets of kneading blades are preferable, as these throw the mass into the center, and then crush it out to the sides of the mixer. Many of these mixers are so constructed that these blades can be reversed so that while at one time they will force the mass into the center and downward, when reversed they operate the mass from the center and crush it against the sides upwards. Many of these are steam-jacketed, thus permitting the mass to be kept soft and plastic, while the mixer is being operated, but letting the mass become nearly dry when cool. This, of course, saves just so much drying after the mass has been placed on trays.

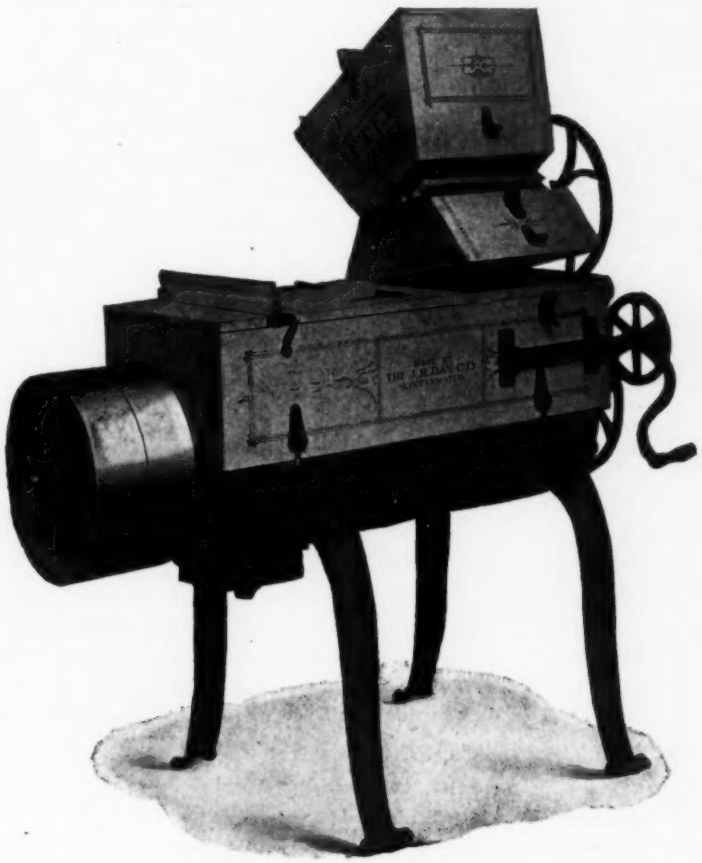

Fig. IV.—Sifter and Mixer.

Excipients.—Water, alcohol, glucose, gelatin, starch paste or jelly, honey, or acacia may be used for excipients. Gelatin and acacia should always be reduced to a jelly or a fluid consistency. At times a manufacturer finds it necessary on account of the physical properties to use ten, twenty, thirty or forty percent gelatin or acacia solution. In some cases it has been found that these should be used warm, in others quite hot, still again certain masses work perfectly with cold solutions. Powdered gelatin or powdered tragacanth should never be used, for slowly disintegrating tablets will result. Some manufacturers, however, find

it expedient to use a small proportion of powdered acacia with the dry granulation after it has reached the compressing machine, if the tablets are not binding properly. This practice should be discouraged. In a great many tablet masses containing vegetable extracts it will be found that these extracts can be used either as a solid extract or in more dilute form, which eliminates the need for other excipients. Glycerin should never be used, as glycerin will not dry out, and forms a gummy tablet, which cannot be coated successfully, cannot carry lettering, and will invariably stick either to the die, or to the punch.

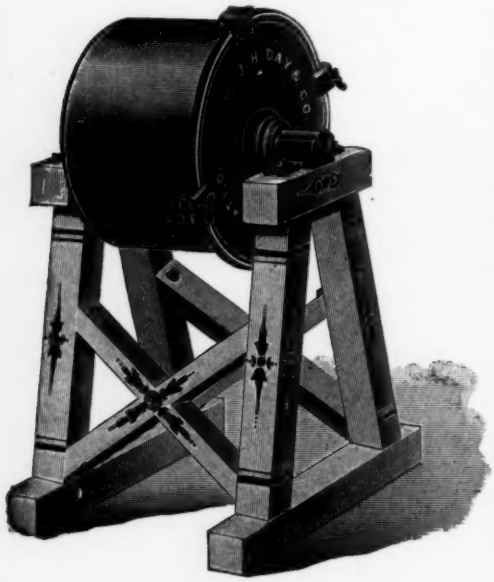

Fig. V.—Ball Mill.

Drying.—The masses, when removed from the mixers, are then subjected to drying. They are broken into coarse particles, and usually spread on sheets of glass, aluminum trays, paper with a properly sized surface, or on cheese cloth, and are then subjected to varying temperatures for different lengths of time. Many types of drying closets are used. For years the most popular was the ordinary closet, arranged in series, heated by steam coils in the back, having an opening near the base, and an opening for the escape of the evaporated moisture at the top. Trays, the surfaces of which were covered with canton flannel, were used in these dryers; the trays being put into the dryers singly, or stacked up on racks, which were then pushed into the dryer. There are objectionable features to this kind of dryer. In the first place the heat cannot be distributed evenly, but will be found more intense at the back of the dryer. This was partially overcome by the continual turning of the trays but the method was wasteful in time and labor. There was no proper air control and most of the moisture evaporated depended entirely on the ascension of the hot air. These air currents often carried foreign particles into the dryer and contaminated the product. Later came development involving the use of mechanical blowers, the heating of the air in outside chambers, and the uniform distribution of the hot air by means of properly arranged flues. This evolution has at last brought us up to very carefully arranged dryers, which show very ingenious steam control, and also the control of the air current, obviating the need for the removal of trays after the dryer had been closed. These dryers are now being manufactured of entirely fireproof material, which can be kept perfectly clean, and do not allow of any contamination even though different products be placed in the same dryer at the same time. There will always be, however, certain products which on account of their very volatile nature must be dried at a very low temperature. The ideal way for drying all granulation is by the use of a vacuum dryer. This aids in retarding the escape of volatile ingredients, and the discoloration of the various salts and extracts

present. Suction pumps have been made so nearly perfect in the last few years that a working vacuum of 28 or 29 inches is not exceptional, and of course no contamination under these conditions is possible. A vacuum system, however, is much more expensive in cost and operation than the air dryer, but just as we must reduce many fluidextracts in vacuum stills rather than in the ordinary evaporating pans, the manufacturer who seeks to turn out a first-class product will be perfectly

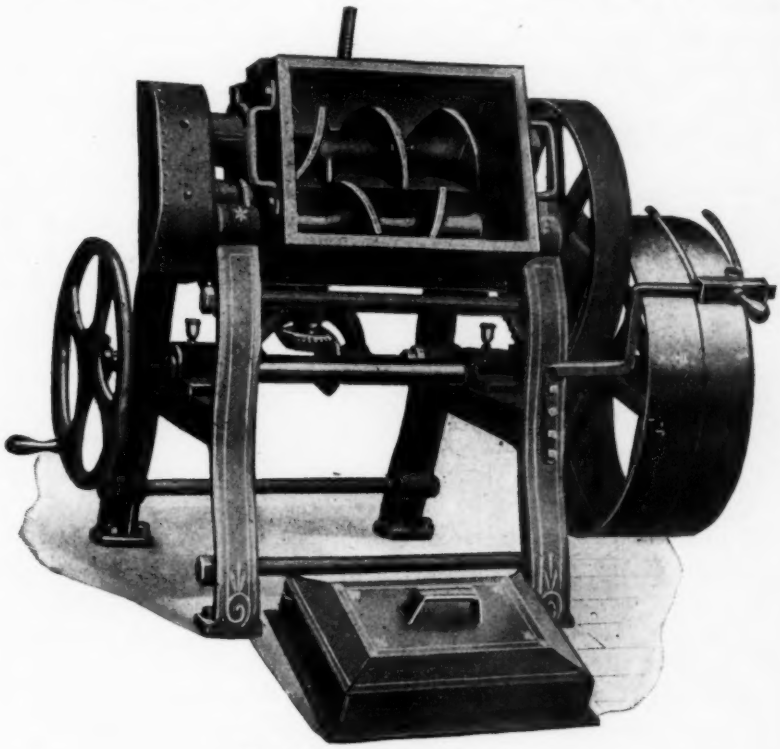

Fig. VI.—Double Blade Mixer.

willing to maintain several of these vacuum dryers. They are also absolutely necessary in making granulation for effervescent tablets, where it is desirable to retain a full degree of effervescence. A more speedy cessation of reaction is possible in the case of effervescent ingredients when handled *in vacuo* instead of in the ordinary hot air dryer. Unquestionably in years past the usefulness of tablets was impaired on account of the granulations being virtually baked. The length of time necessary for drying and the proper temperature has been worked out to a very fine degree. It will be readily seen that masses containing volatile oils, camphor, chloral hydrate, the salicylates, caffeine, salol, and like ingredients cannot be subjected to a high degree of temperature. In fact many of these have for years been air dried, meaning they have been dried at normal temperature. In all cases it is absolutely necessary to have granulations containing these ingredients examined before they are compressed into tablets, in order that the manufacturer may be sure that the full amounts of all ingredients claimed are present. In fact some of these volatile ingredients are mixed with the balance

of the prepared ingredients immediately before placing them on the compressing machines, and are not incorporated in the original mass, and thus forced to go through exposure to heat. The writer has often seen crystals of benzoic acid, caffein, and like materials sublimed on the "sight glass" on the face of a vacuum dryer, where the temperature was only 100° F. This shows the great care that must be exercised in drying, not so much from the standpoint of wastefulness, as for the need of turning out a finished product containing 100 percent of all the ingredients incorporated. These granulations, when dried, must be very carefully screened.

Screening.—A great many well-trained pharmacists still have the idea that a number 20 granulation or powder means anything that will pass through a screen having twenty meshes to the linear inch. This idea if carried into practice with the manufacturer would play havoc with his methods. To him a number 20 granulation means that which will go through a number 20 screen, but will remain on the surface of a number thirty. The adherence to this rule is necessary, as has been shown in the foregoing paragraphs. With the developing of certain improved screening apparatus the manufacturer is fast getting away from the old hand methods which were extravagant in time and labor, and were also objectionable on account of the possibility of contamination from the hands of the operators. Very clever apparatus has been devised, which in the case of different size granules requires only the changing of the piece of wire screening, which can be done in a few moments.

Fig. VII.—Rack for Trays.

Protection from Exposure.—The granulation must be protected during its entire progress from all contamination with outside sources. It should be quickly fed into the hopper of the machine and the hopper immediately covered. Naturally, where power transmission is so largely involved as in tablet making, there is continually the possibility of contamination from dust due to the moving shafting, pullies, belts, and also lubricating oils necessary for all moving parts.

Suction Systems.—The dust involved, however, is removed in most well-ordered plants by having a suction system terminating in hoods in the close proximity of the tablet machines. How very necessary these suction systems are, has been oft-times demonstrated by tieing a canton flannel sack over the exhaust end of this system and examining the dust which is found collected there. This examination shows the manufacturer why he loses from two to eight percent of his ingredients in the manufacture of tablets. In some cases where continued runs of only one tablet are made, the air from the exhaust end of this suction system is forced through water, and the trapped material is then recovered from the solution. In the majority of cases it proves best to feed the granulation into the hopper while still slightly warm.

Moisture.—The presence of moisture makes the tablet stick to the dies or punches and in some cases precludes all possibility of operating the presses on certain types of tablets during the humid months of July and August in these localities, unless air, dried over calcium chloride, is forced into the room containing the presses.

Polishing Dies and Punches.—Now naturally arises the question as to how to prevent the more or less developed tendency to stick. In the first place the surfaces of dies and punches are polished to a mirror-like surface, and these have to be repolished frequently. It is usually done by simple devices assisted by the use of the finest emery obtainable, worked into a paste-like consistence with glycerin. Some ingredients wear the surfaces rough more quickly than do others. For instance, the punches and dies employed in the making of a tablet containing five grains of Blaud's Mass will show wear under fifty thousand production, whereas the same punches and dies could be used for making a million tablets of aspirin or some of the acetanilid group without showing any perceptible wear. This wear also affects the appearance of the tablet. It will often be found that edges, and rings by some spoken of as "wings," form on tablets due to the fact that there may be a worn condition of the punch or die which permits a slight amount of the tablet

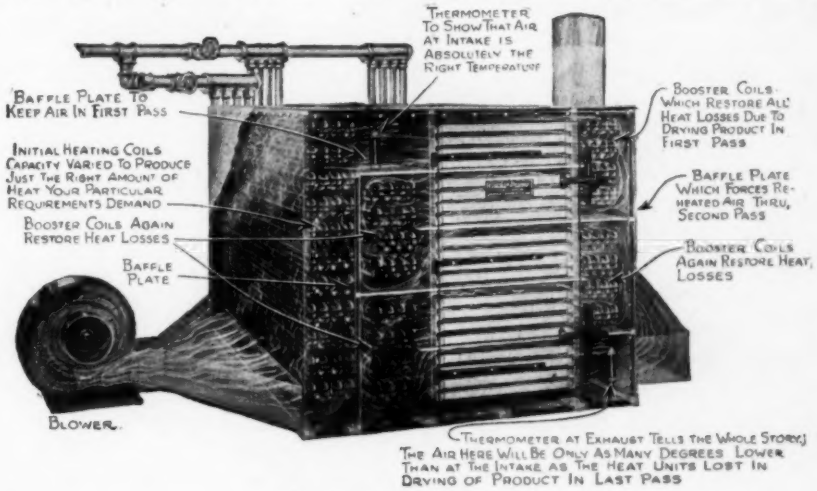
Thermometer To Show That Air At Intake Is Absolutely The Right Temperature
Baffle Plate To Keep Air In First Pass
Initial Heating Coils Capacity Varied To Produce Just The Right Amount Of Heat Your Particular Requirements Demand
Booster Coils Again Restore Heat Losses
Baffle Plate
Blower
Booster Coils Which Restore All Heat Losses Due To Drying Product In First Pass
Baffle Plate Which Forces Re-heated Air Thru, Second Pass
Booster Coils Again Restore Heat Losses
Thermometer At Exhaust Tells The Whole Story. The Air Here Will Be Only As Many Degrees Lower Than At The Intake As The Heat Units Lost In Drying Of Product In Last Pass

Fig. VIII.—Gordon Dryer.

ingredient to squeeze up between the die and punch. This is objectionable, not only on account of appearance, but these rims will rub off the tablets after they are packed in bottles, and will make the tablets and container dusty. The only solution for this difficulty is a new set of dies and punches. A tablet from a highly polished surface will in a great many cases show a glass-like finish on top, bottom and edge. It is impossible, however, to give some tablets the fine glass-like appearance which is to be found on others.

Moist Appearance.—If you will stop to think you will remember that you have never seen a shiny aspirin tablet, nor have you ever seen a shiny quinine tablet, or an acetanilid tablet having a high-surfaced appearance. These tablets some manufacturers speak of as the "moist group," because they always have a dull, moist appearance. You will also remember that the bottle containing these tablets had always a blurred appearance due to the fact that no amount of blowing will remove the dust from the surface of such tablets. On the other hand, there are thousands of tablets which could be put into a bottle and shaken for a long period of time, as is the case in the shipping of them all over the world, and the tablets will still possess the glass-like surface and the bottle will show no murkiness.

Sticking.—It will be found that the first mentioned, or moist tablets, give the greatest difficulty on account of their tendency to stick on the punch. This difficulty is controlled by the addition of a small quantity of talcum powder. The tablets often stick to the punch, which accounts for the concavity sometimes found on the surface of the tablets, due to particles adhering to the punch. The term used for this by the manufacturer is "picking," which means that the punch picks a small surface out of the tablet. If the press be operated at this stage the hollow in the surface of the tablet will grow larger with each tablet made, as a slight particle of each succeeding tablet will stick to the original speck which has bound itself to the punch. Talcum will obviate this, and is used in varying amounts up to $^1/_8$ grain to the tablet, according to the size of the tablet and the requirements which the manufacturer maintains for his product. Talcum should never be used unless absolutely necessary, and then only in the smallest amount which will give the desired results. No conscientious manufacturer would want to put talcum in his tablets if he could possibly avoid it.

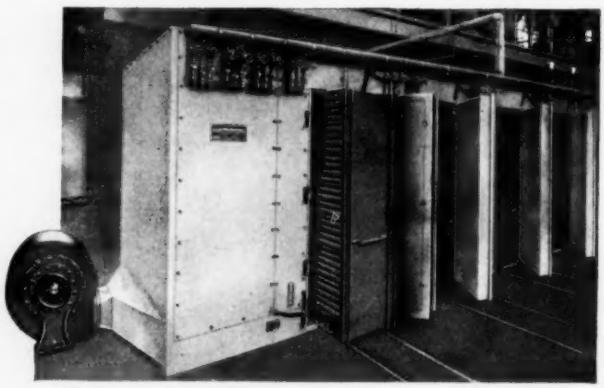

Fig. IX.—Gordon Dryer.

Edges.—Now for the edge, or side, of the tablet. Talcum is of no use in this case. It must be remembered that the blow on the material is made by the two punches, whereas the die fulfills a two-fold function. It prevents side-way expansion of the material under pressure, and it is also the cylinder through which the tablet is forced when the punch lifts it to the surface for its speedy exit from the die plate. The finest grades of white mineral oil have been found most suitable as the lubricant to prevent sticking to the die. Here you will find again that the surfaces of different tablets vary. The edges of some are bright and hard like glass, while others are dull. You will by this time have drawn the very reasonable conclusion that the dull finished tablets require more mineral oil than do those of bright finish.

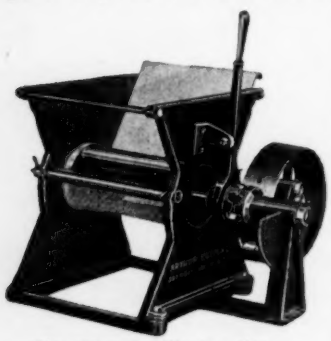

Fig. X.—Oscillating Sifter.

Tablets for Solution.—It might be well to mention that in the case of tablets to be used for solutions the manufacturer in some cases resorts to boric acid instead of talcum, or as in the case of lithium tablets he may use lithium benzoate, which has proven very helpful. Oil should never be used in these tablets as it will come to the surface of the water when dissolved and present an unsightly appearance

varying in degree with the amount of oil used. This is why all such tablets are usually made of large diameter as they present less surface to the sides of the dies, and consequently bind less.

Disintegration.—As was mentioned in an earlier part of this article the disintegration of compressed tablets is a matter of great moment. Certainly the excipients used and the quality of extractives incorporated, together with the pressure exerted on the compressing machine, play a very positive part in the later disintegration of the tablet. For many years all kinds of experiments were made with tablets of different formulae in order to find what proportions of these various influencing agents would give the speediest disintegration. Manufacturers very carefully treasured formulae of tablets that gave a quickly disintegrating tablet. In fact the entire manufacturing business for years was surrounded by a cloud of great secrecy. In these days of research, however, it would seem to the writer that there is absolutely no need for the reserve that is still practiced regarding methods and formulae. The great disintegrating agent which stands far above all others is potato starch. One-sixteenth or one-eighth of a grain of potato starch will permit

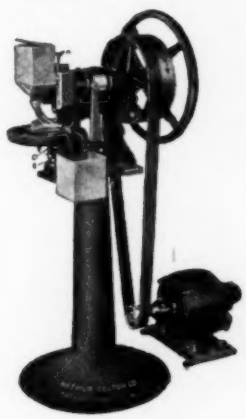

Fig. XI.

Fig. XII.

Fig. XIII.

Tablet Presses.

of practically any tablet disintegrating quickly when placed in a solution. The usual test method in the manufacturing laboratory is simply to drop the tablets into water and in the operator's terms "see how soon they break up." Potato starch swells so rapidly, that in nearly all cases tablets will rupture as soon as they are dropped into water. The potato starch should, of course, be added to the dry granulation immediately before placing it in the hopper of the compressing machine.

Lettering of Tablets.—An interesting feature at this stage is the lettering, or as the manufacturer would say, the "monograming of tablets." As a rule where lettering is to be done on tablets a number 30 granule is resorted to, as the coarse particles will not fill evenly into the curves of the engraving. Some ingredients are better adapted to raised letters, while it has been found that with others the lettering should be indented. On account of the great tendency to sticking,

no manufacturer would want to use lettering on a tablet unless he felt that considerable value was to be obtained from his having each tablet bear his special mark or design.

Compressing Machines.—It might be interesting to note that the blow on most of our large size compressing machines registers a pressure of from four to six tons. There are several types of machines on the market. The single press, which refers to the one making a single tablet at each revolution, is the most used. These machines maintain an output of from forty to fifty thousand per day. Then we have the large multiples, which are practically of the same design, only being built much larger, and heavier, and which carry from two to twelve corresponding holes in a single die, thus making from two to twelve tablets at a revolution, or from two to twelve times as many tablets in a day. These multiple presses in later years have largely given way to the rotary press, a press which contains fifteen punches fixed in a rotating collar, having corresponding dies beneath, which punches are independently operated when they come under a deep-seated roller which forces them down. These rotary machines, however, are only applicable where large runs of tablets are to be made, as the difficulties and time involved in changing so many dies and punches are considerable. Multiple arrangement is also found in rotary machines. Within the last two years it has been found possible to make a rotary machine of sufficient strength to carry three punches to each die, thus multiplying the output of the machine by three. These machines will then give an output of from eleven to twelve hundred tablets per minute. For long runs of five million or more tablets, these machines work admirably, but are quite expensive, and except in the case of the largest manufacturers cannot be economically used. It is the aim, of course, of every manufacturer and tablet machine maker to devise a machine that will run as continuously as possible. When you stop to think that the shutting down of a machine like the last mentioned for even five minutes entails a loss in output of six thousand tablets, it will be seen how necessary it is to have the granulation in absolutely proper form supplied to the machine, and the machine in perfect adjustment. Several of the large pharmaceutical houses in the United States have found it necessary for proper development in this direction to manufacture their own machinery, but very satisfactory machines for general purposes may readily be purchased.

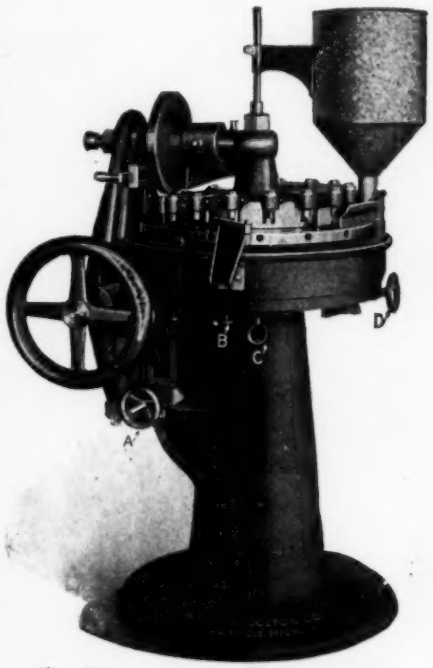

Fig. XIV.—Multiple Rotary Press.

As must have been seen from the foregoing, the life of a tablet maker is not a happy one, and it is the firm conviction of the writer that all tablet makers are

made, and not born. Successful tablet making requires a full pharmaceutical training, and in addition requires all the mechanical genius of a millwright, a master mechanic, an engineer, an electrician, and moreover requires the perseverance of a Napoleon, and the patience of a Job; coupled with this the power of leadership, and the ability to coerce operators to do work which they dislike to have their person stained with various colors which would by no means be mistaken for rouge, to breathe frequently everything in the list from valerian to podophyllin, to taste eternally quinine, strychnine, and cascara compounds, to be muzzled oft-times from morn to night like a rabid canine, and to wear goggles which make you look like a deep sea monster. If a man possessing these qualities can be found, he should after twenty-five or thirty years' experience develop into a good tablet manufacturer.

Upper and Lower Punches and Die for Multiple Rotary Press.

Fig. XV.

Fig. XVI.

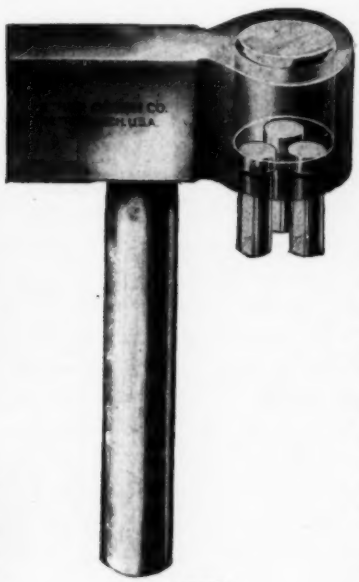

Fig. XVII.

NEED FOR REGULATION OF THE EXPORTATION OF NARCOTIC DRUGS.*

BY A. W. LINTON.[1]

Information in regard to the quantities of narcotic drugs exported from the United States is not easily obtainable. The one who studies the published reports of our exports does not find narcotics scheduled as such, since these are included under the general classification of "drugs and chemicals." It is the pur-

* Read before Section on Education and Legislation, A. Ph. A., City of Washington meeting, 1920.

[1] The writer wishes to acknowledge his indebtedness to Dr. Wm. K. McKibben, Secretary of the China Club of Seattle, for much of the material included in this paper.

The China Club of Seattle is an organization including in its membership many of the prominent business and professional men of Seattle, and having for its objects the fostering of cordial relations between China and the United States, and the encouragement of commercial intercourse between the two countries. Dr. McKibben, himself a resident of China for many years and deeply interested in everything concerned with the welfare of that country, has collected much material concerning the shipment of narcotics to China, and this was freely placed at the disposal of the author of this paper.

Mention should be made also of an article by Professor John Dewey, of Peking, which appeared in the *New Republic* of December 24, 1919. Professor Dewey is a member of the faculty of the Columbia University and is now an exchange professor at the University of Peking. He is eminently fitted to write on present conditions in China.

pose of this paper to give information concerning the amounts of opium, opium alkaloids, and cocaine being exported by way of the Pacific ports of the United States, to give some facts in regard to the final disposition of these drugs, and to show reasons why the exportation of narcotics should be restricted.

The writer has been able to obtain accurate information as to the quantities of narcotics shipped from the Port of Seattle to the Orient during the five months' period extending from July first to December first, 1919. The quantities are:

Morphine hydrochloride..	108,152 ounces	Crude opium.....	21,128 pounds
Morphine sulphate.....	100 ounces	Cocaine hydrochloride.....	13,144 ounces
Morphine phosphate.....	200 ounces		

One ship which cleared during this period, the Fushima Maru, sailing on November fifth, carried 11,660 ounces of morphine salts, 5,864 ounces of cocaine hydrochloride, and 2,577 pounds of opium. While complete information is not available as to exports from San Francisco, the writer is reliably informed that during the same period of five months 64,000 ounces of morphine salts were shipped from that port. Perhaps it will be easier to understand the enormous proportions of the traffic if the amounts are stated in terms of average medicinal doses. The exportations by way of Seattle alone during the five months' period amount to 379 million average medicinal doses of the morphine salts, 23 million doses of cocaine hydrochloride, and 148 million average doses of opium. There were in the customs office at Seattle awaiting shipment at one time during December, 1919, a few cases consigned from New York and Philadelphia to Oriental ports containing 59 million U. S. P. doses of the morphine salts and 17 and one-half million U. S. P. doses of diacetyl morphine hydrochloride. These cases represented an investment of $203,000.

The narcotics which left Seattle from July first to December first, 1919, were carried in Japanese vessels and were all consigned to Japan. When it is understood further that large shipments of narcotics of British manufacture which are sent to New York and are trans-shipped in bond are forwarded to Japan by way of Pacific ports, it becomes apparent that Japan is purchasing narcotics in immense quantities. The amounts shipped by American consignors to Japan by way of Seattle alone during the five months' period above mentioned amount to about ten doses for every man, woman and child in Japan. The sale of narcotics is rigidly restricted in Japan, and their illicit use there said to be very limited. We should bear in mind also that the number of educated physicians in Japan qualified to use and prescribe narcotic drugs is relatively small in proportion to the population. How then shall we account for Japan's large importations of morphine, opium, cocaine and heroin?

There is abundant evidence that by far the greater part of the narcotic alkaloids purchased and manufactured by Japan find their way to China. That the Japanese are distributing morphine and other narcotics in China on an immense scale is vouched for by many witnesses; and so far as the writer has been able to learn, this evidence is not disputed. The witnesses include American missionaries, travelers, and business men returning from China; as well as Chinese business men and students who come to this country. Numerous articles charging the Japanese with this traffic have appeared, both in American magazines and in

English language periodicals published in China. Some of these articles have been written by Americans, some by Britishers.

There are three principal avenues by which morphine enters China from Japan. It reaches North China (Manchuria and adjoining provinces) by way of Darien, principally through the mails. In the "leased territory" controlled by Japan in northern China as well as in many other parts of China, the Japanese have their own post-office system, and Chinese officials have no jurisdiction over Japanese post-offices and packages passing through them. This allows abundant opportunity for distribution of illicit goods. Central China is reached through Tsing Tau in Shantung province. By an agreement between China and Japan, goods landed in Tsing Tau from Japan on "certificate of government" are free from examination by customs officers. Morphine is smuggled into South China by way of motor boats from Formosa. The drug is retailed through the southern provinces by Japanese and Chinese peddlers, each of whom carries a passport certifying that he is a citizen of Formosa, which renders the Chinese officials powerless to punish him.

Wherever the Japanese predominate in China, morphine is easily obtainable. In most parts of China opium is very expensive at present, but morphine, which is so easily smuggled and so cunningly distributed by the Japanese, is available even to the poorest coolie. It is reliably reported that Chinese who pay visits to Japanese brothels in Korea and in northern China are given several free "shots" of morphine, which is generally sufficient to establish the craving. Cheap hypodermic syringes have been generally introduced; however, the poorest addicts of the drug are usually not provided with syringes, but for a few coppers obtain an injection at a Japanese drug store or other place of business.

Great Britain as well as Japan has a share in drugging China. All honor must be given to Britain for carrying out in full her share of the agreement with China by which she undertook to gradually reduce the amounts of Indian opium exported to China, provided the Chinese would at a corresponding rate decrease the cultivation of the poppy and the smoking of opium. Indeed, the British discontinued the shipment of opium to China three years before the time set for the consummation of the reform, and in 1913 announced to the world that the exportation of opium from India to China had ceased. However, although the British nation was undoubtedly sincere in this reform, Great Britain was not to continue to be blameless of sending narcotics to China. In 1912, by an international agreement, the nations agreed to discontinue the shipment of morphine to China. At that time, Britain was shipping to Japan the not inconsiderable amount of 30,000 ounces of morphine annually. By 1917 this had jumped to 600,000 ounces a year. Everyone who was interested knew that most of this immense quantity was going to China. The British people, again aroused to a sense of their duty to China, demanded that their nation's participation in the crime be brought to an end. A regulation was, therefore, put into effect which forbade the shipment of opium derivatives to Japan except by government license, and this license was granted only in cases in which the Japanese governmemt had certified that the drugs offered for export from Great Britain to Japan were for medicinal use, and that in Japan only. In spite of this, British morphine is still finding its way indirectly to China. The regulation neglected to forbid the sending by parcels

post, and a parcels post package of morphine may easily contain tens of thousands of doses. And as we have already shown, British morphine is going through this country in bond enroute to Japan, which means to China. This is possible because our laws allow foreign goods arriving at an American port to be placed in bond for trans-shipment without inquiry as to the nature of the goods. Therefore, British morphine, which could not be sent to Japan direct except by parcels post, is shipped to New York, placed in bond for trans-shipment, sent across the continent to Seattle, and thence to Japan.

However, we cannot, by calling attention to the sins of Japan and Great Britain, atone for our own shortcomings. We have shown that through the looseness of our customs regulations we are making it possible for British manufacturers of narcotics to evade the regulations of their own government. We are being made an intermediary for the shipment of British morphine to Japan and thence to China. But still more serious is the fact that we are ourselves selling enormous and rapidly increasing amounts of opium and narcotic alkaloids to Japan. The consigners of most of the large shipments of morphine and cocaine which pass through Seattle en route to the Orient are among the largest and best known manufacturers of alkaloids in America. These manufacturers would probably not care to be mentioned in connection with this traffic. The writer does not wish to censure these houses too severely. Doubtless they have been able to answer to their own consciences in the matter. Perhaps they are not well informed in regard to the manner in which China, in spite of the splendid fight she made to eradicate opium smoking, is being flooded with drugs which are far more dangerous to her people than opium. This information is available, however, to those who are interested in the subject.

It has been the custom of this country to bitterly censure Great Britain because for so many years she forced Indian opium upon China, and the "Opium War" has been frequently mentioned as a proof of the perfidy of England. However, it ill behooves us to criticise Great Britain as long as we ourselves are helping to drug China, as we are to-day. True, we are not directly responsible for the distribution of the narcotics to the Chinese people, as is Japan, but we are certainly participants in the crime.

Why should the United States feel any responsibility or any qualms of conscience in this matter? Many reasons might be mentioned. China is a sister republic, weak and torn by internal dissension, but still a republic, looking to us for justice and support. We owe her consideration because of the splendid fight she made to stamp out the opium habit, a fight which challenged the admiration of the world, and which apparently culminated in almost complete success. It is true, according to reliable reports, that poppy cultivation is being introduced once more in certain parts of China, due largely to the fact that the Peking government has lost control of some provinces, and that the revolutionists license poppy cultivation in order to obtain desperately needed revenue to carry on their struggle. But can we blame China greatly for producing opium when she finds great powers, both those which she regards as her enemies, and those which have posed as her friends, conniving to foist upon her habits more deadly than opium smoking?

We owe it to China to stop the sale of narcotics in the Orient because America has always stood as the friend of China in the matter of aiding her to shake off

the curse of opium. The International Opium Conference held at Shanghai in 1908 was called at the instance of the United States. America is regarded as the leader of the modern movement for the suppression of the opium traffic, and has guaranteed to the world the sincerity of China. Shall we renounce all of these pledges because we now see for ourselves some financial gain from the international traffic in narcotics?

However, even from the standpoint of cold calculating business we show poor judgment in helping to drug China. Before the famous agreement was arrived at between China and Great Britain, which went so far towards eliminating the opium habit from China, British chambers of commerce in China were petitioning their home government to stop the sale of opium to China, not simply on moral grounds, but because opium was destroying the buying power of China. The population of whole provinces was so enslaved by opium that almost the entire resources were consumed in providing the drug. These British business men in China realized that if England persisted in selling opium to China she could expect to sell her nothing else, because China could buy nothing else. The demand for western goods has only begun to be aroused in China. The potential buying power of 400 million people we can hardly estimate. China would rather buy our goods than those of any other nation. To-day she regards America as her best friend. But just as an American dope fiend is an unprofitable citizen of his community, so a Chinese enslaved by morphine does not promise to be a good customer for our American manufactured goods. Every shipment of narcotics which crosses the Pacific decreases the buying power of China.

There is another reason why to protect our own interests we must more carefully guard our exports of narcotics. A certain part of those we send abroad are certain to find their way back to our shores. Every member of the crew of a vessel from the Orient calling at a Pacific port of the United States is a potential smuggler. It is impossible for customs officials to entirely prevent these people from bringing or sending ashore quantities of drugs to find their way into the illicit trade. On board the British steamer Cyclops, which arrived in Seattle in June, 1919, from the Orient, was seized by American customs officers 675 ounces of cocaine, and sixteen ounces of morphine. These alkaloids were of American manufacture and had been shipped to Japan only to recross the Pacific. Had the inspectors not found them on the Cyclops, they would certainly have been smuggled ashore and peddled out. Customs officers comment on the fact that smugglers are usually "dope fiends." The question may be raised whether they are drug users because they are smugglers, or smugglers because they are drug users. Probably it works in both ways, but the linking of the two is significant. It is certain that we cannot enforce the Harrison Anti-Narcotic Law at home so long as we are willing to send abroad unlimited quantities of narcotics, knowing full well that a part of the evil we intend for others will return to curse our own people.

There are some remedial measures which suggest themselves. Our Treasury Department should be respectfully urged to include in the published statistics of goods exported, statements in regard to narcotic drugs, which are at present lost in the drugs and chemicals classification. It should be required that all applications for permits to export narcotic drugs be submitted to the Treasury Depart-

ment at Washington, and if the application is for exportation to Japan the latter country should be required to guarantee that the goods will not be reshipped to China. Furthermore, we should press upon our own government the action urged by the Conference of British Chambers of Commerce assembled at Shanghai upon the British Government; namely that "The production of habit-forming drugs be limited to the amount required for legitimate use, and their export limited to such countries as have established laws and regulations which effectively control the traffic in these drugs, and restrict their use to legitimate purposes only."

ABSTRACT OF DISCUSSION.

C. W. JOHNSON: There are, in my opinion, other reasons besides our desire to help China for stopping these exports of narcotics. The first reason is loyalty to our own country. If Japan succeeds by such means in controlling China, then China becomes more and more a menace to the United States.

I saw that shipment from the Cyclops stored in Seattle and in custody of the Internal Revenue Officer. A large part of the cocaine was stored in square, rectangular boxes, labelled on the outside, but on the inside of those boxes were little blue envelopes containing the cocaine. *No label on them at all.* You and I may surmise why they were not labelled.

CORNELIUS OSSEWARD: During 1917, 124,764 pounds of crude opium was imported into the United States, in 1918, 160,671 pounds, in 1919, 730,000 pounds. Why should there be such an increase in the demand for opium? It goes largely into the manufacture of morphine. There are just as many manufacturers of narcotics in this country as in England or Japan. I think that our Government has been asleep. We could tell you tale after tale of morphine coming back into this country from China and Japan, and how it is going out of this country in large quantities to drug China. The people in Seattle are loyal, but their efforts are limited, and the matter must be referred to the Government. Just before leaving Seattle I saw a news item stating that the shipment of narcotics out of Seattle was to be stopped. I don't know how reliable this information is, but it is absolutely necessary that the United States stop the importation and exportation of these narcotics.

CHARLES H. LAWALL: I make no motion, but simply offer the suggestion that the meeting here in Washington presents the opportunity for us to meet personally, perhaps, some of the Revenue officials and place our views before them. It can do no harm. These men are approachable and amenable to reason, and it may be of great and lasting value to have some action taken on this important matter.

Mr. Linton presented the following resolution, which on motion received the approval of the Section and was referred to the General Session of the Association for action thereon.

RESOLUTION PRESENTED BY A. W. LINTON.

WHEREAS, The last few years have witnessed the renewal of the use of narcotics by the people of China in a way even more deadly and dangerous than the opium from which the nation recently freed itself by a heroic moral effort, this renewal of narcotics being the use of morphine and similar drugs; and

WHEREAS, The Government of the United States entered into covenant with the Governments of China, Japan, Great Britain and other nations at the Hague Conference in 1912 whereby stringent and effective measures were proposed for the protection of China and other countries from such drugs; and,

WHEREAS, The full execution of these protective measures has been hitherto restrained by the non-participation of a few nations, namely, by lack of signatures of one Latin-American nation and three or four minor European nations; now therefore be it

Resolved By the American Pharmaceutical Association that the Congress of the United States be urged to give immediate effect to these measures without waiting for their full ratification; and *Resolved, Second,* That we applaud and join in the recent action of the Conference of the British Chambers of Commerce assembled at Shanghai

in "urging upon the British Government to control the production of such habit-forming drugs and to limit their production to the amount required for legitimate medical use, and to limit their export to such countries as have established laws and regulations which effectively control the traffic in these drugs and restrict their use to legitimate purposes only;" and

Resolved, Third, That we respectfully urge American manufacturers, importers and dealers in narcotic drugs and alkaloids, to refuse to accept orders for these commodities from Japanese firms except in those cases in which the order is accompanied by a guarantee from the Japanese Government that the articles are intended for medicinal use only and that they will not be re-shipped from Japan.

CHARLES H. LAWALL moved "that the officers of this Section take such steps as are necessary to bring about personal interviews properly delegated persons, members of the American Pharmaceutical Association, and the officers of the Treasury Department, for the purpose of calling their attention to certain abuses with which we are confronted." Seconded and carried. (See also address of Assistant Prohibition Commissioner H. M. Gaylord, under Minutes of Section on Commercial Interests.

GOOD PUBLICITY.

The Journal of the Michigan State Pharmaceutical Association and the Detroit Retail Druggists' Association reprints an editorial from the *Grand Rapids Herald* under the caption of "No Bootleggers Here"—it reads:

"Michigan druggists aren't of the stuff of bootleggers. That much was demonstrated in the early hours of the annual State convention in this city. The spirit of the convention appears practically unanimously opposed, not only to the illegal 'blind pig' selling of whiskey on a prescription basis, but as well to the sale for beverage or toilet waters, hair tonics and similar drugs.

"One of the old stand-pat arguments of the anti-prohibitionists was the promise that under a dry regime every drug store would become a saloon. In some sections of the United States the prophecy may have come true. It has not and will not in Michigan. There may be a long profit in featuring alcoholic hair tonics and toilet lotions, but Michigan druggists aren't after that kind of money. There may also be a large field for the sale of wood alcohol to the thirsty, but this trade also bears the stamp of their disapproval. They intend to obey both the letter and the spirit of the law."

The *Herald* believes that the men of the Michigan drug trade have displayed in their attitude toward the problems brought upon them by prohibition a fine, upstanding sense of good citizenship and business integrity.

The Journal comments on the moral at this: "Had there been no State Association there would have been no representative expression of principles and consequently no recognition from the press.

NATIONAL WHOLESALE DRUGGIST'S ASSOCIATION ACTIVITIES.

Recognizing the importance of having a uniform drug law, the American Bar Association has appointed a committee with James S. Sexton as Chairman for the purpose of codifying the laws of the different States and drafting a measure that will meet with general approval. The National Wholesale Druggist's Association has been invited to assist in the preparation of this law and has agreed to do so.

The *Buckeye,* which is this year's title of the convention booster of the N. W. D. A., has made its first appearance. It will appear regularly until the 46th annual meeting of the association, which is to be held in Cincinnati, October 25–29, 1920, is history. The advantages of Cincinnati as a convention city and reasons why members of the association should attend the convention constitute the major part of the subject matter in this issue.—*Oil, Paint and Drug Reporter.*

SECTION ON COMMERCIAL INTERESTS, AMERICAN PHARMACEUTICAL ASSOCIATION.

ABSTRACT OF THE MINUTES OF THE SESSIONS HELD IN THE CITY OF WASHINGTON, MAY 8 AND 10, 1920.*

The first session of the Section on Commercial Interests, A. Ph. A., was convened by Chairman H. S. Noel, May 8, at 9.30 A.M. The first order of business was the reading of the Chairman's address. It follows:

ADDRESS OF THE CHAIRMAN OF THE SECTION ON COMMERCIAL INTERESTS.

BY H. S. NOEL.

The Section on Commercial Interests of the American Pharmaceutical Association is particularly fortunate in many respects that the meeting this year is being held in Washington. By reason of this fact we are enabled, through the courtesy and coöperation of members of the Local Branch of the Association, to secure speakers of national reputation whose subjects are of great interest at this time.

Your officers believe that the work of this Section is of a professional nature, and that the commercial pharmacist or druggist can establish his own status as a professional man. This thought is expressed advisedly because the keynote of men and women interested in pharmacy is service, whether their training has been along commercial lines or along scientific lines. It follows then that constructive suggestions that assist in fitting us to become better business men and women in turn assist us to better serve the public.

Last year at the New York meeting the sessions of the Section on Commercial Interests proved to be among the brightest spots of the convention. The sessions resolved themselves into veritable short courses in business ethics: investments, banking, insurance, auditing, advertising, buying and selling.

It was not without some trepidation that your chairman went about the duties of his office and the preparation of a program for 1920. The pace set by the 1919 meeting was decidedly fast and unusual in that many of the contributors to its success were quite outside the retail drug field. The idea seemed a good one, not that our membership does not number among it gentlemen amply qualified to inspire our audiences, but by reason of the fact that it is good to hear from specialists in other lines from whose experiences much can be adopted and who bring to us light on many interesting topics from new angles of approach.

The program this year may be said to be both inspirational and practical. It has been your chairman's studious endeavor to make it so. We need vision; we need faith; we need also advice to assist us in upholding the laws. These are trying times. The turbulent state of affairs that is the natural heritage of war is a law breeder and laws are no respecters of men. There are times when it is a temptation to disregard the law, when to rebel openly seems the logical course to pursue. The time to act in order to avoid impractical legislation is before it is enacted. The method of combating it then is by means of organized local, state, and national associations. It is indeed unfortunate that the drug trade is so apathetic, so lethargic concerning such vital matters until after they begin to inflict their hardships. As has been stated by many good authorities, pharmacy needs no new organizations; rather it needs concerted action and coördinated, united effort. Plans have been formulated in the past but for one reason or another they have fallen through. The latest idea, entitled "Organizing American Pharmacy" is being fostered by Dr. E. L. Newcomb, of Minneapolis. His plans are very ambitious, one might say almost Utopian, but they are worthy of very careful consideration and earnest thought, and your chairman, feeling that some such idea would greatly improve the status of pharmacy and the pharmacist, recommends to the Council that every encouragement possible be given to Dr. Newcomb's project.

A review of some of the legislation that affects the drug trade is interesting at this time. We have had the general pharmacy laws of the states, food and drug acts, state and Federal, and the narcotic laws, state and Federal. Among others have been the insecticide laws, weights and measures laws, Federal explosive act, and finally the amendment to the Federal narcotic

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* Papers with discussions will, hereafter, be printed apart from the minutes. It is understood, unless otherwise stated, that the papers were referred to the Publication Committee.

act, and the Federal prohibition laws. These and many more intimately concern the drug trade. New problems and new responsibilities must be met and measured up to in a manner that will characterize men representative of the business of pharmacy. There may be room for difference of opinion, but as Americans who have helped to build the great institutions of liberty and helped safeguard American traditions, we know that the way to better conditions, under a democratic form of government, can never be realized in evasion, subterfuge, or artifice. And Democracy must live by the united support of law-abiding citizens, regardless of hardships or the apparent injustice of regulations imposed upon them. The solemn truths of Lincoln very fittingly sum up the situation, irrespective of class or calling.

> "Let every American, every lover of liberty, every well-wisher to his posterity, swear by the blood of the Revolution never to violate in the least particular the laws of the country and never to tolerate their violation. * * * * * * Let every man remember that to violate the law is to trample on the blood of his father, and to tear the charter of his own and his children's liberty. Let reverence for the laws be breathed by every American mother to the lisping babe that prattles on her lap; let it be taught in schools, in seminaries, and in colleges; let it be written in primers, spelling books, and in almanacs; let it be preached from the pulpit, proclaimed in legislative halls, and enforced in courts of justice. And, in short, let it become the political religion of the nation, and let the old and the young, the rich and the poor, the grave and the gay, of all sexes and tongues, and colors and conditions, sacrifice unceasingly upon its altars."

It is a regrettable fact that echoes are still being heard concerning distinctions between pharmacists and business men—professionalism and commercialism. It seems so futile. To your chairman there is no distinction save that personal characteristic that causes one man to honor a calling and another to misuse it. Business is a profession and is rapidly receiving recognition as such. The public, the arbiter of practically all such things, is recognizing business as a profession about as rapidly as it is forgetting pharmacy as such. Your chairman believes that pharmacy as a profession is losing ground in the public eye and that it is most futile for any group of men to buck evolution or to stop the trend of public opinion. There will always be a field for pharmacists, but the professional recognition that will come to the man or woman who is graduated in the none too far off future will come because of higher entrance requirements and a broader, better knowledge of such subjects as biology, physics, chemistry, economics, accounting, business law, literature, salesmanship, advertising, banking, and mathematics. Two, three, or even four years devoted to teaching a young man pharmacy, materia medica, chemistry, microscopy, etc., who has had a grammar school education or one or two years in high school, with the idea of turning out a professional man, seems absurd to your chairman. The scarce, highly paid men in the successful drug stores of to-day are those of managerial ability and sound business training. It is regrettable that our schools of pharmacy are not turning them out more rapidly.

If the schools of pharmacy of this country will standardize entrance requirements, making them higher, and broaden their commercial courses, giving their students actual business practice instead of theory, much good can be accomplished for these students. Some young men and women have definite aims and it should be possible for a student to select for himself the courses that will best serve his needs after graduation.

The Section on Commercial Interests should be interested in knowing what our schools of pharmacy are at present offering in the way of commercial courses. This might be made a very interesting part of the program of this Section for 1921, and your chairman recommends that a committee of three be appointed to make investigation and report at the next annual meeting.

In 1919 Chairman E. Fullerton Cook recommended that a committee be appointed by the chairman of this Section to ascertain the relationship existing in the retail drug store between sales, first cost, expense, and net profit. The idea in mind was that these figures, made available in a general way, would prove of great value to the drug trade. Some preliminary work was done on this matter, but owing to the uncertainty of business affairs due to unsettled conditions, varying costs, etc., it was abandoned. Since conditions are little, if any, better at this time your chairman hesitates about reappointing a committee, yet feels that at some future time a good survey should prove of wonderful assistance.

On motion of J. W. England the address of the Chairman was accepted and the recommendations adopted.

R. P. Fischelis, L. A. Seltzer and D. F. Jones were appointed members of the Committee on Nominations.

Mr. Merle Thorpe, editor of *The Nation's Business*, was introduced. He addressed the Section on "Business is Business." Some of the points considered by him were:

The defensive part business has played as a profession, carrying with it the implication that business ethics are different from the ethics of other professions. The rôle played by politics and the resulting legislations. The romance and adventure of business, its inspirational side, professional attributes, etc. The three great professions—law, medicine and the ministry set apart from business. Professions measured by service that business has given the world.

A rising vote of thanks was given Mr. Thorpe.

Prohibition Commissioner John F. Kramer addressed the Section on the regulations and importance of the enforcement of the Prohibition Act.

ABSTRACTS FROM THE ADDRESS OF JOHN F. KRAMER, PROHIBITION COMMISSIONER.

In my opinion, there never was adopted a principle in this country that has brought about such a radical, and in many cases sudden, change as has the principle of prohibition—sudden to business, to the individual, and to the economic affairs of the country. That makes it important to consider very carefully the matter of carrying out the Eighteenth Amendment to the Constitution of the United States and the laws in connection therewith, because whatever is done along that line touches vitally upon personal affairs, business affairs and economic affairs.

Prohibition is here to stay; it has been written into our Constitution and it will never in the history of the country be taken out. That makes the carrying out of the principle all the more important. It does not mean that you and I as American citizens are going to obey the principle for a day, or a week, or a month, or a year, or disobey it for a day, or a week, or a month, or a year. It means that you and I as American citizens are going to respect and honor and revere the supreme law of the land for all time to come. If it were just for a day I would not be concerned with it.

We have prohibition here to stay and the question is how are we going to accept it. We are living in a democracy. We are living in a republic. In a democracy and in a republic there are not two different classes of people. There are not the governed and those who are not governed. In other words, the people govern themselves. And it is not the province and the duty of the officials of the land alone to try to see that the laws are obeyed, but it is the province and duty of every American citizen, as far as possible, to see that the laws of the land are obeyed and respected. The people of the land speak through their representatives. They act through their agents. When you business men select an agent you don't go off and sit down and say "We have no business." You transact your business through your agents and you are just as much interested in the business as you ever were before. That is how business is carried on in a democracy—in a republic. But too many people make the mistake of selecting an agent and then saying "let the agent do it." You are responsible for the acts of your agents.

I am appealing to you and to your organization to get back of your agents and help us out with the biggest job ever entrusted to agents. You have through your organization indicated your attitude—that you want to help us. There is no other line of business that has been so vitally affected by this principle of prohibition as that of the druggists and pharmacists, and there is no line of business that is as liable to be dragged down as the drug business due to this principle of prohibition, unless the utmost care is used in the enforcement of the laws concerned with this provision. You are practically the only agency in this country that is permitted to handle intoxicating liquors.

A great many druggists have complained to me that, due to the present construction of the law, they are classed as retail liquor dealers. The statute requiring you to pay a tax of twenty-five dollars puts you in that class, and I don't blame you for finding fault with the classification. The liquor traffic is now outlawed.

I want to call your attention to a danger at this time. The matter of issuing books for prescriptions and approving applications for the withdrawal of bottled liquors by druggists is

of grave concern. Let me tell you this: If the door is thrown wide open and the department in Washington issues all the books that physicians want, and we approve all the applications for withdrawals, the business will be a "retail liquor business." You will understand I am not implying that the great number of physicians will lend themselves to questionable prescribing of liquor, or that very many druggists will prosecute their business for gain in an illegitimate way. I do not mean that at all. But you know it takes only a few men in any profession to bring all of the members into disrepute. I am asking you men and women to help us in so adjusting these matters that we can prevent those who have no respect for their business and for their profession from dragging you down to a lower level.

I started out the Federal prohibition officials in the various states not with a rule, but with a suggestion that they might take as a basis for the approving of applications for withdrawal a certain figure and issue a book of prescriptions containing one hundred blanks. I know that you cannot make a hard and fast rule to cover every business; conditions vary. But we must have a basis for guidance. Before we adopted this rule, physicians in no distant city were writing as many as 485 prescriptions a day. We did not have to go to Chicago to find that, either. One of the druggists in that same city was filling all of them, not only for this one doctor but all the doctors who sent prescriptions to him. This druggist filled 6900 prescriptions in a little over a month. It does not take a very wise man to arrive at the conclusion that if that thing goes on some druggists will be liquor dealers. I don't want to interfere with business. If a druggist needs 200 wine gallons of liquor he ought to have it, if he is going to use it in a right and legitimate way. If a prescription is written, it is pretty difficult for the druggist to say whether it should be filled or not. But there are cases where he could readily say "No." If a doctor sends in 300 prescriptions a day the druggist would be justified in refusing to fill the prescriptions, because it is plain the doctor is not acting in good faith. I would not hesitate in the least to take away the permit from a doctor who writes that many prescriptions daily, nor that of the druggist who fills such prescriptions. No honorable druggist would want me to act otherwise.

The law says that all prescriptions should designate the druggist who fills them and be signed, in handwriting, by the man who issues the prescriptions. If they don't come in to you that way you ought not to fill them. A great many druggists fill emergency prescriptions. There is no such thing as an emergency prescription any more; only in rare instances are they to be found. We have made a provision for the doctors that if they do not happen to have a prescription book, and a case before them requires immediate treatment with intoxicating liquor, they can use another blank, but they must state these facts on that blank. You should never have more than one such order a week. Some doctors after using up their official blanks write emergency prescriptions for colds, bronchitis, etc., not coming into the class of emergency cases at all. As long as business plays fair we will play fair with business. I would not think of taking away a permit of a druggist who makes a mistake through an oversight; you don't need to be worried about that. The only object we have in view is to help business and to keep it on the plane where it ought to be.

We have a big proposition before us. We tackle men's jobs every day and we get away with them. And that is what we will do with this job—not in a day, or a week, or a year, but in a generation. I was struck by the statement made by the speaker who just preceded me, when he said that it "was almost impossible to carry on the retail drug business without a lawyer." Well, that is so. It is almost impossible for lawyers to conduct their legal business without having other lawyers to help them out. You haven't anything on us. Things are getting somewhat complicated, but we live in a democracy where things are done by the people. When inspectors come into your place of business, don't think that they are coming in merely to see whether they can get some charge against you. They are coming in to help; at least, they are so instructed. You can't always tell; you can give them instructions, but some won't heed or obey them. If you have any complaints to make about inspectors, write to me and I will see what can be done.

Preceding a general discussion of the subject, W. L. Crounse presented a paper on "Alcohol—Its Relation to Science and Industry." (See pp. 600–609, June issue JOURNAL A. PH. A.)

A vote of thanks was tendered to the Commissioner and to Mr. Crounse. C. A. Mayo moved that the paper by Mr. Crounse be referred to a special committee, with the view that suggestions be forthcoming for the guidance of pharmacists in the dispensing of liquors. Carried.

ABSTRACT OF DISCUSSION.

The discussion which followed was participated in by Messrs. Beringer, Mayo, Emanuel, Walton, Antonow, Selzer, LaWall, Osseward, Anderson, Lascoff, Crounse, the Commissioner and others.

Mr. Mayo stated he had held the view that liquor should not be dispensed by pharmacists, but had now about arrived at the conclusion that it was the duty of pharmacists to dispense for medicinal purposes. He also participated in the discussion of other questions.

Mr. Beringer was of the opinion that it was as much the duty of pharmacists to fill bona fide prescriptions for whisky and brandy as for any other medicines; that pharmacists should be relieved of the odium of being designated retail liquor dealers. Mr. Anderson concurred, and offered suggestions relative to other designation. The latter proposition was freely discussed from various viewpoints, and a motion carried to request the Council A. Ph. A. to appoint a committee to study the matter and seek by Congressional enactment to bring about a betterment of present conditions, more particularly with reference to the designation, which under the prohibition law was not in conformity with facts.

Mr. LaWall called attention to saloon men seeking to employ registered pharmacists. Mr. Lascoff made a similar statement. Mr. Antonow spoke of his efforts in keeping the same class out of the drug business in Chicago, who sought to engage therein for the evident purpose of selling liquor. The consensus of opinion was that any pharmacist who engaged in the liquor business, who violated the Harrison law and prohibition laws, should have his license revoked. All felt keenly the injustice of being classed as retail liquor dealers, and that a change was a matter of importance to the drug trade, medical practice and the people. Mr. Osseward and others called attention to the lack of uniformity, if not conflict, of State and Federal laws.

Commissioner Kramer stated that the Department coöperated with states in the enforcement of prohibition laws. Federal permits do not give a person immunity under State laws. In some instances State laws were more stringent than the Federal law.

Mr. Emanuel was of the opinion that the Volstead Act was not consistent with other revenue laws. The Internal Revenue law provides for the licensing of liquor dealers; the Volstead law prohibits the sale of liquors except as medicines. Commissioner Kramer did not recognize the inconsistency; he said, "the granting of permits and exacting the tax are two different propositions."

The first session of the Section on Commercial Interests was then adjourned.

SECOND SESSION.

The second session of the Section on Commercial Interests was convened by Chairman H. S. Noel at 9.50 A.M., May 8.

Clyde L. Eddy read his paper on "Why Chain Stores Succeed."

H. M. Gaylord, Assistant Prohibition Commissioner, then presented side-lights on narcotic legislation.

ABSTRACT OF ADDRESS OF H. M. GAYLORD, ASSISTANT PROHIBITION COMMISSIONER.

In his preliminary remarks, Mr. Gaylord spoke of the helpfulness of the American Pharmaceutical Association, other associations and the drug trade generally, in drafting the regulations of the amended Harrison Act. He also stated that further assistance and counsel would be asked by the Department.

He referred to the regulations which required the signature of the recipient of a prescription containing narcotics; that considerable opposition had come from druggists relative thereto; that the Department was now investigating, through their field officers, the value of this requirement, and if deemed advisable there would be a revision of these regulations.

Mr. Gaylord stated that the annual inventory which is required to be made at the time of registration or re-registration will not be required of the registrants in Classes 1 and 2, who submit a monthly return giving the amount of narcotic drugs on hand, from month to month, and in that case an inventory will not be required prior to the payment of fees, about July 1.

CONTROL OF THE NARCOTIC TRAFFIC.

The United States was the prime mover among the nations of the world for the control of the Narcotic Traffic. The Hague Convention was called at the instance of America, and the

American Government was the leading Government there in voicing the conscience of the world in respect to this matter, and that convention adopted the program to which we bound ourselves when we became a signatory to the convention. While we have gone further, I think, than any other nation in the world, we have not by any means done all the things which we there agreed to do. This has been due to the fact that immediately after the convention concluded its labors the world war broke out and the thoughts of men were absorbed in the great conflict and all their spirit was given to America's great purpose. It seems right, therefore, that we should take an inventory of where we stand on this matter with regard to our promises, which we made, and see what we should do further to carry out the agreements of the Hague Convention.

The Harrison Act is a very substantial compliance with the promises made at the Hague Convention, but with regard to the promises as to exportation and importation we have fallen down. For instance, we agreed to limit the importation of the drugs under strict Governmental regulation to certain ports, but that is not being observed. It has been suggested that it would be proper to amend the Harrison Act with regard to importation so as to limit the importing power to the raw material, that after the raw material entered this country it should be assayed for narcotic content, and the manufacturer should be made to account for all the drugs that he has received.

Most of you are probably familiar with the Act of January 17, 1914, the Customs Act, which undertook to carry out the promise at the Hague Convention that they would not export to any country which did not become a signatory to the Convention in accordance with the agreement entered into to establish control of the use of narcotic drugs, and that generally we should see that the exports of narcotic drugs were for legitimate medicinal purposes. The Act of January 17, 1914, vested the authority to promulgate regulations in regard to these matters in three different departmental factors of the Government. I think that this is one reason why no action was ever achieved in regard to this matter under the law until very recently, because when the law gives jurisdiction to three different departments, unless there is some one in each of these departments who is extremely interested in these matters, it is almost impossible to get any action. A committee was appointed, but what ever became of the committee of investigation is a field for speculation. Last summer there came into my office Mrs. Hamilton Wright, known throughout the world in every consulate and recognized as the one who, perhaps more than any other person, is familiar with the whole international situation with regard to the narcotic question, and she inquired of me what had become of our promise made at the Hague Convention, with regard to controlling exports of narcotic drugs and that such exports should be used only for legitimate medicinal purposes. From that inquiry there developed an interdepartment committee which drafted the regulations that have been promulgated and are effective the first of this month (May, 1920). They do not live up to half of the promises which we made at the Hague Convention, although it is hoped that they will somewhat restrict the export of narcotic drugs from this country. Without attempting to criticize the manufacturers of drugs in this country I will state that the exportation of drugs to the Orient has resulted in very serious diminution of the American prestige in China. Drugs exported from this country have been used for improper purposes in that country and it has enabled a rival nation to inaugurate a very extensive program of propaganda against America. There is no doubt that the remarkably exalted position which this country has held in the Chinese mind is threatened by debasement, due largely to the fact that large quantities of drugs have been sent into China from the United States and used for improper purposes. It seems to me we shall not be able to carry out the promises of the Hague until we amend our export law so as to require that exports are to licensed consignees in foreign countries and that the drug is actually needed for legitimate medicinal purposes.

I am asked to suggest to this Association that paregoric—the formula for paregoric in the U. S. P.—be changed during the coming revision of the U. S. P. so that it will no longer be an exempt preparation. The request is made to me that I submit it to you. I leave it to your Association to consider.

Concluding, Mr. Gaylord again expressed his appreciation and that of the Department for the coöperation of the American Pharmaceutical Association, and said "We all know it is of the very greatest importance to lift the restraints off from the legitimate trade in narcotics as far as possible and how necessary it is to the welfare of our country that we put all the restraint we can on the illegitimate trade in narcotics."

ABSTRACT OF DISCUSSION.

Mr. Emanuel stated that most retail pharmacists did not sell enough narcotics to physicians to pay the extra twelve dollars required as wholesalers. He asked the reason for the provision. Replying, Mr. Gaylord admitted that this tax did not seem exactly right, but the differentiation between wholesaler and retailer in the law compelled the Department to act accordingly and was beyond its control and discretion. Mr. Osseward called attention to the fact that many retail pharmacists discontinued selling narcotics to physicians because of this extra tax, and it devolved on a few to supply them. He was pleased that the inventory referred to would not be necessary. Mr. Gaylord said that a treasury decision, now in the final process of determination, will not require a new inventory, and any recent inventory will be accepted, in case other requirements have been complied with.

The question was asked why the Department required the names of purchasers of exempted narcotic preparations; that no official had called for these records from the questioner. Mr. Gaylord replied that the Department was now determining the value of these records, and the requirement would be dispensed with if the results did not show justification for it.

Mr. Philip stated that it was the desire of the Association represented by him to register exempted narcotics by number instead of by name. The present method informed the patient of the name of the drug and had a tendency to create addicts. This information is withheld when the patient signs by number. Mr. Gaylord considered this a good suggestion. Mr. Emanuel contended that to change the formula of paregoric would extend its use.

Mr. Mortenson moved as a recommendation to the Council A. Ph. A., that a resolution be adopted condemning the practice of supplying other nations with narcotics for illegitimate uses. Carried.

A vote of thanks was tendered Mr. Gaylord.

The Committee on Nominations reported the names of the following as nominees for the ensuing year:

Chairman, Charles O. Lee, of Indiana.
Secretary, C. W. Holzhauer, of New Jersey.
Associates, Adam Wirth, Louisiana; Frank Schachleiter, Arkansas; Sinclair Jacobs, Georgia.
The nominees were elected by a unanimous vote.

The following papers were read:

"Honest Advertising Will Not Sell Goods," by Lyman F. Kebler.—The goods that honest advertising will not sell are those which will not bear investigation, and those referred to have been subject to the scrutiny of the Post Office Department, largely those purporting to be cures for venereal diseases, tuberculosis, etc.

"Foreign Trade in Pharmaceuticals," by L. F. Schmeckebier, Chief of Research Division, U. S. Department of Commerce.

"The Value of Good Will," by J. H. McCormick.

"Would it be Beneficial to the Student of Pharmacy to Develop his Knowledge of Commercialism," by F. E. Caballero.

The final session was then adjourned.

THE WORLD WAR VETERANS' SECTION, AMERICAN PHARMACEUTICAL ASSOCIATION.

ABSTRACT OF THE MINUTES OF THE SESSIONS HELD IN THE CITY OF WASHINGTON, MAY 7 AND 8, 1920.

The first session of the World War Veterans' Section, A. Ph. A., was convened by Chairman Robert P. Fischelis, May 7, at 2.00 P.M. In the absence of Secretary W. D. Walters, Tappen Fairchild, of New York City, was appointed temporary secretary.

THE CHAIRMAN'S ADDRESS.

Chairman Robert P. Fischelis brought out the following points in his address:

1. Considerable difficulty had been experienced by the Section in getting its work under way, because of changes in the location of the Secretary, who removed from Cincinnati to Fort

Leavenworth, Kansas, during the year, and also because of the fact that the offer of free memberships in the Association to soldier and sailor pharmacists did not carry with it the A. Ph. A. publications.

2. Over 2,200 members had been brought into the American Pharmaceutical Association by the Section.

3. An enormous amount of propaganda and publicity work had been done by the Section in furthering its membership campaign, aided by the A. Ph. A. Local Branches, State associations, boards of pharmacy and colleges of pharmacy.

4. That $1,000.00 had been appropriated by the Association for the Section's "recruiting campaign."

5. That no notices of the meeting of the American Pharmaceutical Association in Washington, except those of the Section's secretary, had been sent to individual members of the Section, and these were mailed just prior to the meeting.

Chairman Fischelis also made the following recommendations: They were referred to a committee consisting of the Chairman, Tappen Fairchild, Clyde L. Eddy and L. C. Bird, with power to act, and to submit recommendations regarding the future of the Section to the Council, A. Ph. A.

1. That in view of the fact that the recruiting work of the Section would be completed in a few months and the Section had therefore really accomplished the main object for which it was organized, that the Section be discontinued as such, and matters of interest to the World War Veterans be included in the future programs of the Association.

2. That adequate financial appropriations be made by the Council, A. Ph. A., to continue the soldier and sailor membership campaign until the end of the calendar year.

3. That some arrangements be made whereby the soldier and sailor members receive the JOURNAL, A. PH. A., so as to bring them into closer contact with the work of the Association, before they become regular dues-paying members in 1921.

Adjourned.

SECOND SESSION.

The second session of the World War Veterans' Section, A. Ph. A., was convened by Chairman R. P. Fischelis, May 8, at 10.00 A.M.

The following papers were presented:

"Pharmacists in the Army and Navy of the United States," by E. Fullerton Cook.

"World War Veterans in the Industries," by Tappen Fairchild.

Chairman Clyde L. Eddy, of the Publicity Committee of the Section, presented a report in which he spoke of the large amount of free publicity given by the pharmaceutical journals of the country, and their splendid coöperation in furthering the objects of the Section.

The Committee on the Chairman's Address approved the recommendation to discontinue the Section as such, and endorsed the appointment of a committee of seven members, to be World War Veterans. The Committee is to be appointed by the President of the A. Ph. A., for the purpose of looking after the interests of the soldier and sailor members, and providing features on the programs of the annual meetings which will particularly interest them. The principal work of the Committee, however, is to serve as a "preparedness committee" of American Pharmacy as suggested by Clyde L. Eddy in his paper read before the House of Delegates.* It will endeavor to bring about a closer relation between colleges of pharmacy and the Army and Navy, tabulate the military resources of the profession, and present a report of this tabulation, each year, to the Surgeon-General of the Army and of the Navy. The recommendation was submitted to the Council and at the second general session of the Association, and approved by both.[1]

The Chairman was instructed to make recommendations to the Council, A. Ph. A., for holding the present soldier and sailor members in the Association and providing them with the JOURNAL.

The Section then adjourned *sine die*.

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* See p 609, June issue JOURNAL A. PH. A.

[1] See p. 726, July issue JOURNAL A. PH. A., and also June issue, pp. 644 to 649.

SECTION ON HISTORICAL PHARMACY, AMERICAN PHARMACEUTICAL ASSOCIATION.

ABSTRACT OF THE MINUTES OF THE SESSIONS HELD IN THE CITY OF WASHINGTON, MAY 8, 1920.*

The Section on Historical Pharmacy, A. Ph. A., held only one session in Washington, May 8, at 9.30 A.M. All of the officers were present.

Chairman W. O. Richtmann presented as his address,

A History of the Cultivation of Medicinal Plants in the United States.

BY W. O. RICHTMANN.

The majority of persons who are interested in one way or another in crude drugs of vegetable origin, in view of their experience during the past five years, are undoubtedly of the opinion that general and particular interest in the cultivation of the plants from which crude vegetable drugs are obtained is, comparatively, a new field, of quite recent development. Articles discussing the general field and also individual plants have appeared frequently after 1900 and, especially, since 1910. It appears, however, that the subject is an old one, and has only been more directly called to our attention as a result of the shortage of these products during most of the above mentioned period. It is not the first time that such an interest along this line has been aroused. Owing to the more generally disturbed conditions throughout the civilized world, a greater and more wide-spread interest has developed than had occurred at any previous time.

Shortly after the first European settlers came to America they interested themselves in the propagation of plants they had been familiar with in Europe, and had collected there. Natural sources of supply were no longer available, so an artificial supply was attempted.

A number of European plants of medicinal interest which have become naturalized, more or less generally, undoubtedly owe their presence here to this cause. Later on efforts along these lines became more general, and were made not only to supply individual and local needs and demands, but also to supply those of the country generally, and even those of Europe, to as great an extent as possible.

Early in the history of Georgia, a botanist was appointed to study the plants, native to that colony and vicinity, that might be of economic interest from a standpoint of timber, cordage, fabric, food, or medicine, and also those of other regions that might be successfully introduced. The work was started, but the man engaged for the work died before any tangible results were obtained. The available records do not indicate that the work was again taken up.

Various members of the Apothecaries Society of London were active in obtaining from and sending to individuals in the colonies medicinal plants and seeds. Records of a number of such exchanges with John Bartram, of Philadelphia, are available.

Probably one of the most elaborate plans along this line was that of John Ellis, a fellow of the Royal Society and the agent for West Florida, who, in 1769, published a "Catalogue of Plants that may be useful in America." This list comprised eighty-two different plants, practically all of which are of medicinal interest. Thirty-seven of them yield official products of U. S. P. IX, and four of the plant products are official in the last revision of the National Formulary, making a total of forty-one or 50 percent, for which there are legal standards at the present time. Many of the remainder of the listed plants yield products that are of commercial importance to-day. It is probable that the above-named catalogue was compiled at an earlier date, as Ellis was appointed agent for West Florida in 1764. The list is to be found in William Stork's introduction of the fourth edition of *John Bartram's Journal*. In 1770, Ellis published "Directions for bringing over seeds and plants from the East Indies and other distant countries in a state of vegetation; together with a catalogue of foreign plants worthy of being encouraged in our American Colony." This was probably one of the earliest steps taken along the lines of our present seed and plant introduction work of the U. S. Department of Agriculture.

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* Papers presented before this Section will, hereafter, be printed apart from the minutes. It is understood, unless otherwise stated, that the papers were referred to the Publication Committee.

Various plants, of greater or less medicinal interest, were under cultivation elsewhere in the colonies, even at that early date. Oranges, especially the bitter orange, had been introduced by the Spaniards in Florida early in the 16th century, and by the English, in Georgia and South Carolina, early in the 17th century. Previous to 1750 oranges were exported from South Carolina.

Sesame was grown, and oil produced from it, in South Carolina in 1730. Twenty to twenty-five bushels (of 52 lbs. each) of seed were produced to the acre. The seed yielded 43% of expressed oil.

The indigo plant was introduced into the southern colonies at an early date, and indigo was successfully produced in South Carolina for a number of years during the middle of the 18th century.

Cotton-seed oil was produced at Bethlehem, Pa., in 1768, by the Moravian Brethren, from seed grown in the southern colonies. Sunflower-seed oil was produced at the same time from seed grown there by these brethren.

Spanish saffron was being cultivated near Philadelphia and Lancaster, Pa., as well as Salem, N. J., at the time of Peter Kalm's visit in 1748 and 1749.

The opium poppy was cultivated in Pennsylvania by H. Marshall for the production of opium as early as 1781.

It will be observed that practically all of the above mentioned plants are not native to the United States. Their introduction into this country necessitated their cultivation. That similar consideration should be given our native plants, used for medicinal purposes, was known at an early date is evident from the fact that the cultivation of ginseng was advised as early as 1784. Our commerce with China had started only the year before, with only ginseng and silver. Samuel Shaw, our first consul at Canton and largely instrumental in the development of our early trade with China, specifically pointed out the advantage of making ginseng the chief article of exchange, and that, in order to maintain the supply of this product, it would become necessary to cultivate it, thereby replacing the rapidly diminishing natural source of supply.

It required unusual commercial conditions to call attention to the diminishing supply of crude vegetable drugs obtained from native plants, and to advise the cultivation of these plants. This occurred during the Civil War. At the 1864 meeting of the American Pharmaceutical Association, John M. Maisch, chairman of the Committee on Drug Market, presented a strong plea for active efforts along the above mentioned lines. No noticeable result, however, was produced as a result of this plea.

In May, 1883, J. W. Colcord introduced the following resolution at the meeting of the meeting of the Massachusetts Pharmaceutical Association: "Resolved, That the committee on legislation be instructed to ask an appropriation of $25,000 by the next Congress, the same to be used at the discretion of the Commissioner of Agriculture, for the introduction and cultivation of foreign medicinal plants, and for the better protection of indigenous medicinal plants." The resolution was adopted, and the Commissioner of Agriculture at Washington, upon being notified of the action, expressed his desire to carry out the purpose of the resolution as soon as he received the necessary authority.

The same resolution was introduced at the meeting of the American Pharmaceutical Association in 1883 by Mr. Colcord. After some discussion, the matter was referred to the Council with power to act. The Council approved the adoption of the resolution at a meeting in December, 1883. No subsequent record is available as to what happened to the resolution.

George Vasey, botanist, made a report to the Commissioner of Agriculture in 1884, on 18 native plants that were of medicinal or economic interest. Natural supplies of these plants were being continually depleted, because of continued commercial demands. In order to maintain the supply, the cultivation of these plants would, undoubtedly, have to be undertaken.

Prior to this, the forerunner of the Commissioner of Agriculture, the agricultural branch of the Patent Office, had been interested in the introduction of medicinal plants.

After a definite start along the above mentioned lines, the botanist of the U. S. Department of Agriculture maintained a continued interest in the work until in 1901, when the office of Drug Plant Investigations was established. Since that time the work of the cultivation of medicinal plants has developed steadily from more or less isolated and localized efforts to a decidedly broad and comprehensive plan. Work has progressed from merely growing plants and har-

vesting so much raw material to a detailed study of many individual plants, from many different angles. The factors of identity, distribution, propagation, cultivation, harvesting, curing, standardizing, and marketing have each been given due consideration with a fairly large number of individual plants. Additional factors along the lines of breeding, selection, physiology, pathology, and bio-chemistry have also been taken up in a number of individual cases.

Working along practically parallel lines, and at times coöperating with the Federal Department, a number of schools of pharmacy have taken up the work; different phases are brought forward, as the various operators interpret their individual viewpoints. The number and location of such places is now such that a fairly general and representative distribution has been effected.

Another line of the problem has been taken up by a number of firms and corporations, primarily interested in the production of crude vegetable drugs on a commercial scale. Practically all of these representatives realize fully the broad lines along which the problem must be developed. They are proceeding accordingly.

Finally, a number of individuals have taken up various phases of the work. Most of them, however, are profiting directly by the pioneer work of the three previously mentioned agencies. No one directly connected with the work of cultivation of medicinal plants feels that more than a mere beginning has been made. When we realize the vast amount of work that has been accomplished in the development of our general agricultural crops and the hopes that these workers entertain for continued future progress, we are made fully aware that the problem is complex, but it is certainly interesting and well worth our best efforts.

Work has progressed from numerous isolated instances of "jes growin" plants early in the history of our country to present-day instances of what has been said of the grape fruit, "it was a lemon that has had a chance." Many medicinal plants under cultivation in the United States are not only given a chance, but many are having chances placed where the plants will have every opportunity to show their capability of taking advantage of them.

The address was referred to the Publication Committee.

The Historian, E. G. Eberle, presented his report; it was in part as follows:[1]

(The omitted portions of the report contain references to papers presented before this Section and commented on in foreign and American publications, some of them not devoted to pharmacy—the papers by Joseph Jacobs and A. W. Linton. Also references to papers of historical interest relating to pharmacy and published in lay press and magazines.)

* * * Since the New York meeting of the American Pharmaceutical Association comparatively few contributions have been made to the Historical Section. Chairman Wilbur L. Scoville has sent a set of the Bulletins of the N. F. IV and page proofs. To this might be added the correspondence of the members of the Revision Committee and like records of U. S. P. Revision could probably be secured. While these have served their immediate purpose, a century hence they will have historical value and interest. Such files, however, take up considerable space, and this is not available at present. Possibly the Smithsonian Institution would be willing to care for such records.

Copies of advertisements of about 1820, a century ago, relating to the drug business and pharmacy, were presented by Prof. J. W. Sturmer. S. L. Hilton has contributed notes from the Smithsonian Institution relating to Physic, Therapy and Occupational Therapy for Wounded Soldiers. Charles H. LaWall has sent in an official invitation to the World's Fair Meeting of the A. Ph. A. in Chicago, with typewritten notes on the back of an outline of a business course by Prof. Joseph P. Remington.

Among the contributions sent in by Treasurer H. M. Whelpley are the following:—A History of the Drug Business in Chicago, written by Albert E. Ebert; letter from John Best and prospectus of New York College of Pharmacy, 1864–5; invitation and program commencement, New York College of Pharmacy, 1865; letters from James G. Steele and W. T. Wenzel, of San Francisco; letter from C. W. Patterson (1912) enclosing sketch of the late Oscar Oldberg; newspaper clippings relating to the "Oldest Drug Store in Davenport, Iowa, owner, life-member John W. Ballard, who had been with the business 54 years."

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[1] Complying with the request for condensation of reports, only the parts of the Historian's Report containing records are printed.

Clyde L. Eddy and J. C. Peacock have contributed a number of interesting photos of the New York meeting. Many photographs of members have been sent in, some of them accompanied by sketches, and the historian takes this opportunity of again requesting that all members who have not done so follow their example. The historian preserves clippings, photographs, programs and badges of annual meetings, and each year a list is made for record for the files of the Section.

As far as our records show there have been 31 deaths of members; they are:

Behrens, Emil C. L.	Chicago, Ill.
Bassett, Chas. H.	Boston, Mass.
Bongartz, Ferdinand Alphonse	Jersey City Heights, N. J.
Donaghue, Richard S.	Lowell, Mass.
Downing, Benjamin Franklin	Newport, R. I.
Eckford, Joseph William	Aberdeen, Miss.
Engelhard, George P.	Chicago, Ill.
Gundrum, George	Ionia, Mich.
Hoffman, Miss E. Grace	Philadelphia, Pa.
Jacob, Charles William	Forest Park, Ill.
Joergensen, G. J. C. Sophus	LaConner, Wash.
Josenhans, Rheinhart	Chicago, Ill.
Lentz, Frontis	Baltimore, Md.
Lord, Leon S.	West New Brighton, N. Y.
Maguire, Edward S.	Detroit, Mich.
McKellips, Clarence M.	Portland, Ore.
McNiff, Frank J	Anthon, Iowa.
Menzies, John W.	Buffalo, N. Y.
Muench, William	Syracuse, N. Y.
O'Gorman, Theophilus V.	Port Townsend, Washington, D. C.
Orr, Edward Emery, Jr.	Revere, Mass.
Patterson, Theodore H.	Chicago, Ill.
Perry, Frederick W. R.	Detroit, Mich.
Pierce, William Henry	Boston, Mass.
Pinter, Edmund D.	Jersey City, N. J.
Purel, Victor Honore	New Orleans, La.
Ryan, Frank Gibbs	Detroit, Mich.
Sieker, Ferdinand August	West Hoboken, N. J.
Stone, Clarence G.	Mount Vernon, N. Y.
Tansey, Owen Hilary	Montreal, Canada.
Tobias, Morris	New York, N. Y.

Of the above, two were members of the Association for 50 years or more, Charles H. Bassett, of Boston, and Theodore H. Patterson, of Chicago. Seven were affiliated for upwards of 25 years—Emil C. L. Behrens, Chicago; Benjamin F. Downing, Newport, R. I.; Dr. Joseph William Eckford, Aberdeen, Miss.; George Gundrum, Ionia, Mich.; Frederick W. R. Perry, Detroit, Mich.; Frank Gibbs Ryan, Detroit, Mich.; and Ferdinand August Sieker, West Hoboken, N. J. All served the Association faithfully, and in conformity with our usual custom to honor the memory of departed members we should stand for a moment in silence.

The Historian has no further suggestion to make at this time, unless you desire to take action on having files of bulletins, proof pages, etc., of the latest revisions of the National Formulary and U. S. Pharmacopoeia, as far as obtainable, filed in the Smithsonian Institution, should they be willing to accept them.[1] Recently we have been made acquainted with the value of our historical records in the Proceedings of the Association whereby the priority of work in colloidal chemistry by our fellow-member, Prof. J. U. Lloyd, was established; so impressed is the authority on the subject that he concludes that our transactions should be used in textbooks

[1] Mr. F. L. Lewton, of the Smithsonian Institution, who was present, stated that such arrangement could be made.

for the general reader. It impresses the thought that we are sometimes slow in placing value on the work of others, and that history lies at the root of all science. Macaulay said, "Facts are the mere dross of history. It is from the abstract truth which interpenetrates them, and lies latent among them, like gold in the ore, that the mass derives its whole value; and the precious particles are generally combined with the baser in such a manner that the separation is a task of the utmost difficulty."

The report of the Historian was received. Mr. F. L. Lewton, of the Smithsonian Institution, was present and spoke of the progress made in arranging medical and pharmaceutical literature and material in the Institution. He also stated that the material referred to by the Historian is acceptable. The Section thanked Mr. Lewton and recommended that efforts be made to collect bulletins, etc., and file them with the Smithsonian Institution, or better, donate them, so as to have a permanent record.

Secretary Curt P. Wimmer reported on his work during the year, preparatory for the program of this meeting. He also read a paper by Miss Adelaide Rudolph on "The Scarabs and Charms of Ancient Times." Various amulets were exhibited. The Secretary was asked to thank Miss Rudolph for her contribution to the program.

Hugo Kantrowitz presented the Section with a menu, printed on silk, which was obtained by him at a banquet given during the meeting in Washington in 1883. The banquet was given at Abner's Hall and an item of "historical" interest is contained in the statement on the menu, "Each person is entitled to a small bottle of Pontet Canet Claret of excellent quality."

The following papers were read:

"Pharmacy and Medicine of Charles Kingsley," by A. W. Linton.
"Reminiscences of Some of the Old Boston Druggists of Fifty Years Ago," by E. L. Patch.
"Development of the Drug Industry in Richland County, Wisconsin," by E. W. Dieter.
"Historical Data of the Naval Stores Industry in the United States," by W. O. Richtmann.
"Early History and Occurrence of Venereal Diseases," by B. E. Hockert.
"A Pharmacist in the Army," by Lewis N. Brown.
"Meeting M. Bouge, Pharmacien De Premiere Classe," by Clyde L. Eddy.

The following were read by title, as the authors were not present:

"The Lititz Army Hospital Pharmacopoeia," by Edward Kremers.
"A New England Drug List of 1676," by Edward Kremers.
"A Pharmaceutical Advertisement of 1795," by Edward Kremers.
"A Century of Pharmaceutical Journalism," by H. P. Reif.

The officers of the ensuing year were installed; they are:

Curt P. Wimmer, New York City, Chairman.
A. W. Linton, Seattle, Wash., Secretary.
E. G. Eberle, Philadelphia, Pa., Historian.

The Section then adjourned.

WOMEN'S SECTION, AMERICAN PHARMACEUTICAL ASSOCIATION.

ABSTRACT OF THE MINUTES OF THE SESSIONS HELD IN THE CITY OF WASHINGTON MAY 8 AND 10, 1920

First Session.

The first session of the Women's Section, A. Ph. A., was convened by Vice-President Mrs. Lyman F. Kebler, May 8, at 9.30 A.M. Mrs. J. Leyden White was named secretary. President Mrs. F. J. Wulling was prevented from attending the meeting on account of sickness.

A telegram of greeting from Secretary Mrs. H. R. Kenaston was read. A letter from Miss Anna G. Bagley was acknowledged by a telegram, expressing regrets for her absence.

The Chairman introduced Mrs. Kate Waller Barrett, President of the National Florence Crittenden Homes and Past President of the National Council of Women, who addressed the Section on the subject of "Organization and Prohibition."

On motion a rising vote of thanks was extended to Mrs. Waller.

The following committees were appointed by the Chairman:

Nominations—Mrs. I. P. Gammon, Mrs. Charles Fuhrman and Mrs. L. E. Sayre.
Resolutions—Mrs. J. Leyden White, Mrs. Charles Merrell and Mrs. Charles Avery.

SECOND SESSION.

The second session of the Women's Section, A. Ph. A., was called to order Monday, May 10, at 9.30 A.M., by Acting-President Mrs. Lyman F. Kebler.

Mrs. Hughes, President of the Housekeepers' Alliance, was introduced and spoke on the subject of "Conservation." A vote of thanks was given the speaker.

The Committee on Nominations presented the names of the following nominees. They were elected.

Honorary President—Mrs. Fletcher Howard,* Los Angeles, Cal.
President—Mrs. Lewis C. Hopp, Cleveland, Ohio.
First Vice-President—Mrs. Charles Holzhauer, Newark, N. J.
Second Vice-President—Mrs. F. C. Godbold, New Orleans, La.
Secretary—Miss Genevieve Simms, Washington, D. C.
Treasurer—Mrs. C. E. Bent, Dell Rapids, S. D.
Executive Committee—Mrs. Lyman F. Kebler, *Chairman*, Washington, D. C.

In harmony with a suggestion of Miss Anna G. Bagley, Mrs. H. M. Whelpley moved that the Women's Section hold one session only hereafter, thus coöperating with the Local Entertainment Committee. Carried.

The Committee on Resolutions reported the following:

That a letter of thanks be sent to the American Pharmaceutical Association for their kindness and constant courtesy.

That a rising vote of thanks be given to the members of the Ladies Local Committee for their tireless endeavors and great success in providing the entertainments and contributing so largely to pleasures of the meeting.

That the resignation of Secretary Mrs. H. R. Kenaston be accepted with regret.

That a letter of sympathy be sent to Mrs. Fletcher Howard.*

The resolutions were adopted.

COUNCIL BUSINESS

A. PH. A. COUNCIL LETTER NO. 2.

WASHINGTON, D. C., June 19, 1920.

To the Members of the Council:

4. *Question of eligibility of non-members of Council for service on Council committees.* Under date of June 2, 1920, Mr. J. W. England writes from Philadelphia, as follows:

"*To the Council of the A. Ph. A.:*

DEAR SIRS:

Having been advised that at the meeting of the Council held May 10, 1920, I was elected Chairman of the Committee on Publication for 1920–21, I must decline such service because I am ineligible for election to this committee, as are, also, E. L. Newcomb and Clyde L. Eddy. We are not members of the Council, and, therefore, not eligible for election to any of the standing committees of the Council.

According to the by-laws of the Association (Chapter VII), the object of the Council is to transact business for the Association, and the object of the standing committees of the Council is to transact business for the Council. The *councilors have no authority to delegate their duties to others; and hence,* the members of the standing committees must be councilors only. Logically, if it be permissible for three non-members of the Council to be members of a standing committee of the Council, it is permissible, also, for all the members of all the standing committees to be non-members of the Council, and this would be absurd.

At the meeting of the Council, held May 10, 1920, a resolution was passed declaring "that members of the standing and special committees of the Council need not necessarily be members of the Council." But such resolution, so far as relates to the standing com-

* Mrs. Fletcher Howard, an active worker in the Association for many years and a regular attendant at the annual meetings during her husband's lifetime, passed away June 19.

mittees, is in conflict with the integrity of the Council and, therefore, null and void.

The special committees elected by the Council were created by resolution of the Council, approved by the Association, or by resolution of the Association to be elected by the Council.

The special committees were created by resolution *for the prosecution of the general work of the Association*, and the Council has the undoubted right to declare that the members of such committees need not necessarily be members of the Council. But the standing committees were established by by-law *for the conduct of the business of the Council*, and the Council has no authority to side-step its responsibilities by delegating its duties to those who are not members of its own body.

The writer asks that the Council take appropriate action with reference to the three non-Council members of the Committee on Publication so that the publication interests of the Association may receive prompt attention.

Yours very truly,
J. W. ENGLAND."

* 6. *Election of active members.* You are requested to vote on the following applications for active membership:

No. 1, Alberto Soler Estevan, Palmarito de Cauto, Oriente, Cuba; No. 2, Oliver A. Waldschmidt, 904 Eleventh St., Milwaukee, Wis.; No. 3, Francis B. Leigh, 1603 E. State St., Trenton, N. J.; No. 4, Harold Noble Law, 113 West Fourth St., Bridgeport, Pa.; No. 5, Laurence Ernest Reidinger, 616 E. Cameron St., Shamokin, Pa.; No. 6, Herbert Joseph Roth, 406 W. Dauphin St., Philadelphia, Pa.; No. 7, Fred Wolff, 26 Arcade Bldg., Pullman Sta., Chicago, Ill.; No. 8, Walter W. Wieczorek, 1174 Milwaukee Ave., Chicago, Ill.; No. 9, Maurice A. Train, 1659 W. Division St., Chicago, Ill.; No. 10, Milton Mitchell Fox, 3309 Milwaukee Ave., Chicago, Ill.; No. 11, William F. Breslau, 3500 Armitage Ave., Chicago, Ill.; No. 12, James Herbert Gray, 111 North Wabash Ave., Chicago, Ill.; No. 13, Charles Rimmeler, 7040 Union Ave., Chicago, Ill.; No. 14, Bernard Poole Furry, Main Street, Bridgewater, Va.; No. 15, Owen M. Lynch, Irvine, Kentucky.; No. 16, Jerome Sivir, 639 West Monroe St., Springfield, Ill.; No. 17, George H. Guy, 2nd and Yesler Way, Seattle, Wash.; No. 18, Roderick T. Black, 168 23rd Street, Detroit, Mich.; No. 19, Herbert Skoglund, 416 W. 60th Pl., Chicago, Ill.; No. 20, Abraham Lincoln Gasen, 5031 Garfield Ave., St. Louis, Mo.; No. 21, Harry Neff, 5th and Rooseveldt Boulevard, Philadelphia, Pa.; No. 22, Herbert Carl Kassner, 201 Hillside Ave., Jamaica, L. I., N. Y.; No. 23, Florence Carolyn Lane, 16 Maple Grove St., Great Neck, L. I., N. Y.; No. 24, Benjamin White, 375 South St., Jamaica Plain, Boston, Mass.; No. 25, Max E. Ahnert, 1844 West Adams St., Chicago, Ill., No. 26, Carl F. Fischer, 701 W. Lake St., Minneapolis, Minn.; No. 27, L. P. O'Farrell, Gorth Road, Scarsdale, N. Y.; No. 28, Benjamin L. Milana, 850 110th St., Richmond Hill, L. I.; No. 29, Emery William Parker, Victoria, Texas.; No. 30, Charles T. Davis, 217 Duffield St., Brooklyn, N. Y.; No. 31, Abraham Saperstein, 1557 Eastern Parkway, Brooklyn, N. Y., No. 32, Paul Elgevir Barton, 3210 Arthington St., Chicago, Ill.; No. 33, Saturnino Vidaurreta, 3236 Chestnut St., Philadelphia, Pa.; No. 34, George F. Baumann, 1233 Maralis St., New Orleans, La.; No. 35, Fred W. Ames, 6056 Hurst St., New Orleans, La.; No. 36, Edward Isaac Joseph, 901 Second St., Alexandria, La.; No. 37, Harry J. Bourgeois, Box 114, Morgan City, La.; No. 38, William N. Watson, Independence, La.; No. 39, Mack Lunsford Brorch, Willifield, La.; No. 40, Joseph Henry Berner, 4700 Freret St., New Orleans, La., No. 41, Bert Augustus Brewer, Arcadia, La.; No. 42, Matilde Martinez, Marta Abreu 15, Sta. Clara, Cuba.

7. *Election of soldier and sailor members.* You are requested to vote on the following applications for soldier and sailor membership, Nos. 1 to 11.

A. G. DU MEZ,
Secretary.

* Item 5 has reference only to change in status of members, and is, therefore, omitted.

BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH

Conducted by H. V. Arny, Reporter on the Progress of Pharmacy, Chairman of the Committee on Research.

On these pages, each month, will be found a list of articles on pharmaceutical research that appear in the pharmaceutical and other scientific journals of the world. Whenever possible, the list appearing a certain month will record articles appearing in American journals of the preceding month and articles appearing in foreign journals will be recorded as quickly as possible after the journals reach the Reporter.

All articles appearing in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK, which will be issued as soon after the end of the year represented as editing and printing conditions permit. Those desiring abstracts immediately can obtain same for a fee of one dollar each by communicating with H. V. Arny, 115 West 68th St., New York, and arrangements can also be made for securing photographic reproduction of entire articles at moderate prices when such are desired.

PHARMACOPOEIAL REVISION.

Ballard, C. W.
Official standards for botanic drugs
J. Am. Pharm. Assoc., 9 (July 1920), 676

Borisch
Suggestions for improving the German Pharmacopoeia
Pharm. Ztg. 65 (Mch. 27, 1920), 212

Gathercoal, E. N.
Improving the U. S. P. monographs for vegetable drugs
J. Am. Pharm. Assoc., 9 (July 1920), 700

LaWall, C. H.
Improving the U. S. P. monographs for inorganic chemicals
J. Am. Pharm. Assoc., 9 (July 1920), 679

Rusby, H. H.
Botanical nomenclature of the pharmacopoeia
J. Am. Pharm. Assoc., 9 (July 1920), 670

APPARATUS AND MANIPULATIONS.

Austin, E. C.
Filter control apparatus
Drug. Circ., 54 (July 1920), 245

Fresenius, F.
A study of condensers
Z. angew. Chem.; through *Pharm. Ztg.*, 65 (Apr. 28, 1920), 312

Goedecker and Rose
Vacuum condenser
Chem. Ztg.; through *Pharm. Zent.*, 61 (Apr. 1, 1920), 198

Kiplinger
Tightening a glass tube, rubber tube connection
Chem. Zent.; through *Pharm. Zent.*, 61 (Apr. 29, 1920), 250

Lenk, E.
Fractionation apparatus for frothing liquids
Chem. Ztg.; through *J. Soc. Chem. Ind.*, 39 (June 15, 1920), 430A

Mezger, F.
New sterilizing flask
Münch. med. Wsch.; through *Pharm. Ztg.*, 65 (Apr. 28, 1920), 312

Waldbott, S.
Alcohol testing device
Perf. Essent. Oil J.; through *J. Ind. Eng. Chem.*, 12 (July 1920), 690

LIQUID AND SOLID PREPARATIONS.

Anon
Isotonic eye waters
Pharm. Weekblad, 56 (June 5, 1920), 666

Anon
Lime-juice tablets containing vitamines
Chem. & Drug., 92 (June 26, 1920), 860

Anon
"Liquid iodoform"
Bol. farm.; through *Pharm. Weekblad*, 57 (June 5, 1920), 666

Bartlett, K. A.
Tincture of vanilla
J. Am. Pharm. Assoc., 9 (July 1920), 706

Bedall, C.
Essentia haemino-albuminata
Arch. pharm.; through *Pharm. Zent.*, 61 (Mch. 4th, 1920), 131

Belak, A.
Dusting powders
Biochem. Zsch.; through *Pharm. Zent.*, 61 (Apr. 29, 1920), 253

Fantus, B.
Iso-alcoholic elixirs
J. Am. Pharm. Assoc., 9 (July 1920), 708

Harden, A., and Robison, R.
Antiscorbutic properties of concentrated fruit juices
J. Biol. Chem.; through *J. Soc. Chem. Ind.*, 39 (June 15, 1920), 422A

Harman, J.
Ophthalmological solution of homatropine
Chem. & Drug., 92 (June 26, 1920), 860

Keulemans, N.
Preparation of "Oleum dericinatum"
Pharm. Weekblad, 57 (June 26, 1920), 758

Lautenschlager, L.
Assay of spirit of camphor
Arch. Pharm.; through *Pharm. Zent.*, 61 (Mch. 4, 1920), 132

Mayer, J. L.
Assay of mercurial ointment
J. Am. Pharm. Assoc., 9 (July 1920), 706

Patzschke, W.
Syrup of neosalvarsan
Dtsch. med. Wschr.; through *Pharm. Ztg.*, 65 (Feb. 21, 1920), 151

Pomeroy, C. H., and Heyl, F. W.
Stability of digitalis leaf extracts
Am. J. Pharm., 92 (June 1920), 394

Rabe, F.
Spurious solution of aluminum acetate
Pharm. Ztg., 65 (Mch. 6, 1920), 199

Simpson, G.
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Brit. Med. J.; through *Chem. & Drug.*, 92 (June 5, 1920), 748

Straub, W.
Physiologic salt solution
Pharm. Ztg., 65 (March 6, 1920), 189

Thum, J. K.
Tincture of nux vomica
J. Am. Pharm. Assoc., 9 (July 1920), 705

Utz
Mercury assay of wound dressings
Pharm. Zent.; through *Schweiz. Apoth. Ztg.*, (June 24, 1920), 327

Van Os, D.
Preparation of compound solution of cresol and of sapoformaldehyde solutions
Pharm. Weekblad, 57 (June 12, 1920), 691

Wende, E.
Simplified fatty acid assay of soap
Arch. pharm.; through *Pharm. Zent.*, 61 (Feb. 26, 1920), 115

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Pharm. Weekblad, 57 (June 5, 1920), 663

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Coupin, H.
Cause of elongated plant growth in the darkness
Comptes rend.; through *Pharm. J.*, 104 (June 5, 1920), 545

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Pine seedlings germinated in the dark
Comptes rend.; through *Pharm. J.*, 104 (June 5, 1920), 580

Fischer, H.
Is starch an assimilation product?
Naturwiss.; through *Pharm. Ztg.*, 65 (Apr. 24, 1920), 294

Gerhardt, K.
Plant excretions and their biological significance
Naturwiss.; through *Pharm. Ztg.*, 65 (Apr. 24, 1920), 294

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Dtsch. med. Wsch.; through *Pharm. Zent.*, 61 (Feb. 26, 1920), 123

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J. pharm. chim., 21 (May 1, 1920), 368

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Pharm. Weekblad, 57 (June 12, 1920), 743

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Arsitochine and optochine nitrate
Pharm. Weekblad, 57 (June 12, 1920), 741

Von Bergmann, G.
Quinidine in heart trouble
Münch. med. Wsch.; through *Pharm. Zent.*, 61 (Mch. 18, 1920), 172

VEGETABLE AND ANIMAL MATERIA MEDICA.

Anon
Peru balsam
Perf. Essent. Oil J.; through *Pharm. Era*, 53 (July 1920), 210

Buschmann, E.
Constituents of squill
Arch. pharm.; through *J. pharm. chim.*, 21 (May 1, 1920), 364

Clayton, H.
Cobra venom and its effects
Australasian J. Pharm.; through *Am. J. Pharm.*, 92 (June 1920), 427

Crawford, A. C.
Pressor compound in the pituitary gland
J. Pharm. Exp. Therap.; through *J. Soc. Chem. Ind.*, 39 (June 15, 1920), 425A

DeKadt, P. J.
The sulphuric acid reaction of cod liver oil
Pharm. Weekblad, 57 (June 26, 1920), 756

Dovey, E. R.
Assay of camphor oil in camphor
Perf. Essent. Oil. J.; through *Pharm. Era*, 53 (July 1920), 210

Farwell, O. A.
Adulterated American centaury and maidenhair fern
Bull. Pharm., 34 (June 1920), 231

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Holmes, E. M.
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Arch. Pharm.; through *Pharm. Zent.*, 61 (Feb. 26, 1920), 130

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Apoth. Ztg.; through *Drug. Circ.*, 54 (July 1920), 257

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Identification of mydriatic drugs
Apoth. Ztg.; through *Drug. Circ.*, 54 (July 1920), 257

Wester, D. H.
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Pharm. Weekblad, 57 (June 5, 1920), 661

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Kauri gum industry
Am. J. Pharm., 92 (June 1920), 417

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Pharm. J., 104 (June 5, 1920), 550

Henri, V.
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Chem. News, 120 (June 18, 1920), 292

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Comptes rend.; through *J. pharm. chim.*, 21 (May 16, 1920), 393

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Science, 51 (June 18, 1920), 605

Mourelo, J. R.
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Chem. News, 120 (June 18, 1920), 289

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Chem. Ztg.; through *Pharm. Ztg.*, 65 (Apr. 17, 1920), 274

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Kryalyse or water-separation
Pharm. Post; through *Pharm. Zent.*, 61 (Feb. 26, 1920), 113

Schmiz, E.
Harmony of the atomic weights
Ber. dtsch. pharm. Ges., 30 (Jan. 1920), 27

INORGANIC CHEMICALS.

Alston, J.
Magnesium sulphate as a wound dressing
Med. Press; through *Pharm. J.*, 104 (June 5, 1920), 545

Artmann, P.
Assay of zinc as zinc-ammonium phosphate
Z. anal. Chem.; through *Pharm. Zent.*, 61 (Mch. 11, 1920), 152

Baumann, J.
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Chem. Ztg.; through *J. Soc. Chem. Ind.*, 39 (June 15, 1920), 401A

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J. phys. chem.; through *J. Soc. Chem. Ind.*, 39 (June 30, 1920), 446A

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Am. J. Pharm., 92 (June, 1920), 401

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Iodometric assay of arsenic acid
J. pharm. chim., 21 (May 16, 1920), 385

Fricktet, H.
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Analyst; through *Pharm. Weekblad*, 57 (June 19, 1920), 745

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Preparation of colloidal mercury
Kolloid. Z.; through *J. pharm. chim.*, 21 (May 16, 1920), 392

Haehnel, W., and Mugdan, M.
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Z. angew. Chem.; through *Pharm. Ztg.*, 65 (Apr. 17, 1920), 275

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Apoth Ztg.; through *Pharm. Ztg.*, 65 (Apr. 17, 1920), 275

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Volumetric assay of iron
Ber.; through *J. pharm. chim.*, 21 (May 1, 1920), 360

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Ber.; through *J. pharm. chim.*, 21 (May 1, 1920), 359

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Z. Elektrochem.; through *J. Soc. Chem. Ind.*, 39 (June 30, 1920), 446A

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Reversible oxidation of arsenous oxide
Compt. rend.; through *J. Soc. Chem. Ind.*, 39 (June 15, 1920), 402A

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Am. chim. anal. app.; through *Pharm. Weekblad*, 57 (June 12, 1920), 710

McLennan, J. C.
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Chem. & Drug., 92 (June 26, 1920), 845

Morris, R. L.
Perchlorate assay of potassium
Chem. News, 120 (June 11, 1920), 282

Nordlund, I.
Preparation of mercury hydrosols
Kolloid Z.; through *J. Soc. Chem. Ind.*, 39 (June 15, 1920), 412A

Paal, C., and Steyer, H.
Colloidal gold amalgam
Kolloid. Z.; through *Pharm. Zent.*, 61 (Apr. 29, 1920), 253

Pickles, A.
Properties of wood charcoal
Chem. News, 120 (June 25, 1920), 301

Sandberg, G.
Magnesium perhydrol in stomach trouble
Therap. Gegenw.; through *Pharm. Ztg.*, 65 (Apr. 10, 1920), 252

Valentin, J.
Titration of metals with arsenic acid solution
Z. anal. Chem.; through *Pharm. Zent.*, 61 (Mch. 1, 1920), 151

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Determination of the absorptive power of charcoal
Pharm. Weekblad, 57 (June 12, 1920), 693

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Action of intravenous injections of colloidal silver solutions
Biochem. Zsch.; through *Pharm. Zent.*, 61 (Apr. 29, 1920), 253

Wester, H.
Detection of manganese and zinc in the presence of phosphates and oxalates
Ber. dtsch. pharm. Ges., 30 (Feb. 1920), 142

Wientjes, K.
Iodine assays of medicaments
Pharm. Weekblad, 57 (June 12, 1920), 703

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Aida, M.
Detection traces of petroleum in vegetable oils
J. Soc. Chem. Ind., 39 (June 15, 1920), 152T

Aldrich, T. B.
Chloretone benzoic acid ester
J. Am. Chem. Soc., 42 (July 1920), 1502

Autenrieth, W.
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Arch. Pharm., through *Pharm. Weekblad*, 57 (June 12, 1920), 744

Beringer, G. M.
Examination of a sample of oil of pennyroyal
J. Am. Pharm. Assoc., 9 (July 1920), 702

Claas, M.
Iron salicylates
Arch. Pharm.; through *Pharm. Zent.*, 61 (Feb. 26, 1920), 114

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Microchemical reaction of cystine
Bull. Soc. Pharm. Bordeaux; through *Pharm. Weekblad*, 57 (June 19, 1920), 774

Elge, F.
German rose oil
Chem. Ztg.; through *Pharm. Zent.*, 61 (March 11, 1920), 156

Fargher, R. G.
Arsenic acid compounds of guaiacol and veratrol
Pharm. J., 104 (June 5, 1920), 580

Fargher, R. G., and Pyman, F. L.
Composition of salvarsan
Chem. Soc. Trans.; through *J. Soc. Chem. Ind.*, 39 (June 30, 1920), 456A

Fischer, E.
Depside and Tannins
Pharm. Ztg., 65 (Feb. 21, 1920), 163

Fox, J. J., and Barker, M. F.
Analysis and composition of cresylic acid
J. Soc. Chem. Ind., 39 (June 30, 1920), 169T

Goldschmidt and Weiss
Solubility of rosin
Chem. Umschau.; through *Pharm. Zent.*, 61 (Apr. 22, 1920), 238

Grant, E. H.
Tests for sparteine and guaiacol
J. Am. Pharm. Assoc. 9 (July 1920), 704

Groll, J. T., and DeGraaff, W. C.
Protein assays
Pharm. Weekblad, 57 (June 19, 1920), 739

Hasse, P.
Detection of wood alcohol in brandy
Pharm. Zent., 61 (Mch. 25, 1920), 177

Heiduschka, A.
Amyl nitrite
Pharm. Zent., 61 (Apr. 8, 1920), 205

Heiduschka, A., and Felser, S.
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Z. Unters. Nahr. Genussm.; through *Pharm. Ztg.*, 65 (Apr. 17, 1920), 275

Heiduschka, A., and Wolf, L.
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Suddtsch. Ap. Ztg.; through *J. Soc. Chem. Ind.*, 39 (June 30, 1920), 465A

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Determination of the solubility of volatile oils in alcohol
Pharm. Weekblad, 57 (June 5, 1920), 651

Huerre, R.
Chemical constants of oil of Juniperus oxycedrus
J. pharm. chim., 21 (May 1, 1920), 347

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J. Am. Chem. Soc., 42 (July 1920), 1481 and 1489

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Administration of novarsenobillon and mercury
Brit. Med. J.; through *Chem. & Drug.*, 92 (June 5, 1920), 748

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Pharm. Weekblad, 57 (June 5, 1920), 655

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Pharm. Weekblad, 57 (June 12, 1920), 678

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Oesterr. Chem. Ztg.; through *J. Soc. Chem. Ind.*, 39 (June 30, 1920), 442A

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Purification of urea
Kolloid. Z.; through *Pharm. Zent.*, 61 (Mch. 18, 1920), 167

Lapworth and Royle
Capsaicin
J. Chem. Soc.; through *Chem. & Drug.*, 92 (June 5, 1920), 748

Lautenschlager, L.
Aldehyde assay of oil of lemon
Arch. Pharm.; through *Pharm. Zent.*, 61 (Mch. 11, 1920), 151

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Carvone assay of oil of caraway
Arch. Pharm.; through *Pharm. Zent.*, 61 (Mch. 11, 1920), 151

Lautenschlager, L.
Cinnamic aldehyde assay of oil of cinnamon
Arch. Pharm.; through *Pharm. Zent.*, 61 (Mch. 4, 1920), 132

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Biochem. Zsch.; through *Pharm. Zent.*, 61 (Apr. 29, 1920), 253

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Compt. rend. Soc. Biol.; through *Pharm. Zent.*, 61 (Apr. 15, 1920), 226

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Ann. Inst. Pasteur; through *J. Soc. Chem. Ind.*, 39 (June 15, 1920), 431A

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Preservation of solutions of vuzin and eucupin
Dtsch. med. Wschr.; through *Pharm. Ztg.*, 65 (Apr. 21, 1920), 289

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J. Biol. Chem.; through *J. Soc. Chem. Ind.*, 39 (June 15, 1920), 422A

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Philipp. J. Sci.; through *J. Soc. Chem. Ind.*, 39 (June 30, 1920), 458A

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Colloidal action of strophanthin
Biochem. Zsch.; through *Pharm. Zent.*, 61 (Apr. 15, 1920), 227

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Ber. dtsch. pharm. Ges., 30 (Mch. 1920), 178

Pohl and Rawicz
Tetrahydronaphthalin
Z. phys. Chem.; through *Pharm. Zent.*, 61 (Mch. 18, 1920), 166

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Alkaloidal assays
Süddtsch. Apoth. Ztg.; through *Pharm. Zent.*, 61 (Apr. 22, 1920), 240

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Cockle-bur oil
J. Am. Chem. Soc., 42 (July 1920), 1507

Rogers, L. J.
Assay of arsenic in organic compounds
Chem. Trade J.; through *Pharm. Weekblad*, 57 (June 12, 1920),710

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Assay of potassium sulphoguaiacolate
Arch. pharm.; through *Schweiz. Apoth. Ztg.* (June 24, 1920), 325

Sidgwick, N. V.
Volatility of benzoic acid and its derivatives
Chem. Soc. Trans.; through *J. Soc. Chem. Ind.*, 39 (June 30, 1920), 466A

Skita, A., and Berendt, W.
Transformation of anilines into cyclohexylamines
Ber.; through *J. pharm. chim.*, 21 (May 1, 1920), 354

Sprinkmayer, H., and Gruener, O.
Volatility of vanillin
Z. Unters. Genussm.; through *Pharm. Zent.*, 61 (Mch. 4, 1920), 136

Stransky
Sources of chelidonic acid
Arch. Pharm.; through *Pharm. Weekblad*, 57 (June 26, 1920), 772

Tsalapatanis, L.
New reaction for acrolien
Anal. Soc. Chim. Argentina; through *J. Soc. Chem. Ind.*, 39 (June 15, 1920), 425A

Utz, F.
Preservation of chloroform
Suddtsch. Apoth. Ztg., 65 (Apr. 14, 1920), 264

Vanino and Herzer
Benzoyl peroxide
Arch. Pharm.; through *Drug. Circ.*, 54 (July 1920), 257

Van Itallie, E. I.
Assay of benzoic acids in fats
Pharm. Weekblad, 57 (June 12, 1920), 688

Vautier, E.
Assay of caffeine in coffee substitutes
Mitt. Lebensmittelunters. und Hyg.; through *J. Soc. Chem. Ind.*, 39 (June 15, 1920), 423A

Vischniac, C.
Primeverose
Bull. Sci. Pharm.; through *Schweiz. Apoth. Ztg.* (June 24, 1920), 332

Wester, H.
Biochemistry of urease
Ber. dtsch. pharm. Ges., 30 (Mch. 1920), 163

Wolff, A.
Hexabromide value of linseed oil
Farber Ztg.; through *J. Soc. Chem. Ind.*, 39 (June 15, 1920), 417A

Zethelius
Treatment of wood alcohol blindness
Hygiea; through *Drug. Circ.*, 54 (July 1920), 257

Zimmermann, W.
Sulphonal and trional tests
Apoth. Ztg.; through *Pharm. Ztg.*, 65 (Apr. 14, 1920), 264

CLINICAL AND DIAGNOSTIC METHODS.

Autenreith, W.
Presence of formic acid in the urine
Arch. Pharm.; through *Pharm. Weekblad*, 57 (June 26, 1920), 773

Boit, E.
Methylene green reaction of urine
Münch. med. Wsch.; through *Pharm. Zent.*, 61 (Mch. 4, 1920), 133

Goiffon, R., and Nepreux
Microchemical detection of sugar in the body liquids
Compt. rend. Soc. Biol.; through *J. pharm. chim.*, 21 (May 1, 1920), 357

Gross, O.
Tyrosinase in urine
Dtsch. med. Wschr.; through *Pharm. Zent.*, 61 (Mch. 4, 1920), 132

Guillaumin, C. O.
Presence of mucus in urine
J. pharm. chim., 21 (May 1, 1920), 337

Guillaumin, C. O.
Simple method of graduating the Yvon ureameter
J. pharm. chim., 21 (May 1, 1920), 342

Lillig, R.
Detection of blood in urine and other excreta
Pharm. Ztg., 65 (Feb. 21, 1920), 150 and 160

Maue, G.
Action of antipyrine on diabetic urine
Pharm. Ztg., 65 (Apr. 3, 1920), 237

Rapp
Opium assay
Apoth. Ztg.; through *Pharm. Ztg.*, 65 (Apr. 14, 1920), 264

Schall
Errors in the sulpho-salicylic test for albumin in urine
Münch. med. Wschr.; through *Pharm. Ztg.*, 65 (Apr. 21, 1920), 286

MISCELLANEOUS.

Anon
Cold flames
Drug. Ztg.; through *Pharm. Zent.*, 61 (Mch. 4, 1920), 133

Glaser, E.
Manufacture of coumerone resin
Der. Seife.; through *Pharm. Zent.*, 61 (Apr. 29, 1920), 252

Loffler, W., and Spiro, K.
Influence of the medium on drug activity
Kolloid Z.; through *Pharm. Era*, 53 (July 1920), 208

Thiene, H.
Standardizing chemical glass-wire
Z. angew. Chem.; through *Pharm. Ztg.*, 65 (Apr. 28, 1920), 312

CORRESPONDENCE

STERILIZATION.

THE EDITOR:

DEAR SIR: On Wednesday of last week I read the contribution of A. W. Linton on "Sterilization," published in the June issue. That article is timely and to the point. I doubt whether anything written for publication in pharmaceutical journals for the past fifty years is of equal importance. There is not one single assertion made by the writer that cannot be substantiated a hundred times a day in any large city, or at least a hundred times each year in any fairly busy drug store, either city or town. The warnings which he sounds are so real and the need to heed those warnings so urgent, that I for one feel keen regret that the author, did not fight for instant recognition, in the form of a committee empowered to work on the matter at once.

After a day given to thought on the subject, the writer of this letter decided to make an excursion into the ranks of our retail trade in Philadelphia, for the purpose of attempting to

discover as nearly as possible the proportion of active daily working druggists who knew anything about the subject of sterilization, and about how much care they exercised in an attempt to get results, if any.

The program was arranged thus: A prominent locality, noted for the beauty of its stores and the apparent care given the matter of merchandise displays, was selected for examination. Ten stores were visited, and to each the following questions and orders were given:

1st. An ounce of sterile distilled water, U. S. P.
2nd. (Question). When was this water sterilized?
3rd. An ounce of sterile normal salt solution.
4th. (Question). How was this sterilized?

It is shameful to be compelled to admit that not one of these ten stores passed the test submitted to them. Imagine the feelings of this writer, when, after entering store after store, accompanied by a medical friend, the same ignorance of the subject of sterilization was encountered.

In stores Nos. 1, 2, 3, 5, 9 and 10 the Pharmacopoeial material sterile distilled water was manifestly unknown, and in each of 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 the article was not on hand or at least had not been reboiled within six to ten days, and no one of them had used any precaution whatever to prevent contamination. Mind you, this in spite of the fact that the U. S. P. gives specific directions for both the preparation and storing of sterile distilled water.

In a visit to another store in a section of the city much given to offices for doctors, an order was submitted for a half ounce of 1 percent sterile solution mercuric cyanide, and a request was made for permission to see the work room of this drug store and to witness the making of the solution. The clerk to whom the order was given put some distilled water into a flask and heated the water over an open flame to an estimated temperature of 150°, and then made a solution of the salt in a graduated measuring glass which looked as though it had been in regular prescription department use. A few questions, rather clumsily put to the worker, placed him on his guard, but also developed the fact that he did not know how to prepare sterile distilled water, and he also did not know that the Pharmacopoeia embodied an article and all necessary information referring to it. He (the worker) has had eleven years' experience in retail drug stores, and had been employed the better part of a year in the place in which this occurred.

It is a singular fact that there has been no improvement whatever in the equipment of the ordinary drug store, with a view to placing that equipment abreast of the times. A more or less indifferent array of mortars and pestles, graduates and stirring rods, and there the matter ends. How much could be said for modern equipment, and what ugly, disagreeable comparisons could be made? Why be like a farmer who deprives himself and family of the use and comfort of a bathtub for the sole reason that his father before him did not have one?

Insist on improvement in this matter, and do it so everlastingly as to compel an improvement. The subject should be taught in our colleges and schools by practical every-day-in-the-harness retail druggists, and not by the professor in charge of that branch of science only. There is a reason for this.

F. W. E. STEDEM.

COMMITTEE REPORTS

REPORT OF THE GENERAL SECRETARY—1920.*

To the President and Members of the American Pharmaceutical Association:

The past year has witnessed a marked growth of membership in the Association. At the present time we are carrying on our list approximately 3,300 active members and 2,000 soldier and sailor members. Over 500 new members have been elected since the last convention, although a period of only eight months has intervened and several months were spent in organizing the membership committee and getting the work started. It is hoped that this steady growth in the membership of the Association will be maintained. It would appear that a large proportion of our S & S members should be converted to active members at the end of the present calendar year and, with the accession of new members which may be counted upon during the remainder of the calendar year, our active membership should soon reach the five-thousand mark.

* Presented at City of Washington meeting, A. Ph. A., 1920.

The income from the National Formulary shows a decided increase over a year ago, due in part, no doubt, to the large enrollment in the schools of pharmacy and the increased demand for the book as a textbook; 3595 copies of the Formulary were sold during the year 1919 and an income of $7,050.13 realized. The total sales of the fourth edition of the National Formulary have now reached 30,047 copies and the total income $52,090.24. Details are given in the subjoined report.

As a result of publicity given through the JOURNAL, a considerable number of proceedings and year books have been sold during the year—larger in fact than any preceding year. The total sales have amounted to $290.80. The new Year Book is almost ready for distribution.[1] It is hoped that we may be able to start at once with the publication of the 1919 volume and if this volume can be issued during the present calendar year, our Year Book will be fully up to date. The detailed financial accounts of the Secretary's office follow:

A. RECEIPTS AND EXPENDITURES ON ACCOUNT OF NATIONAL FORMULARY IV.

JANUARY 1, 1919, TO DECEMBER 31, 1919, INCLUSIVE.

I. Expenditures.

J. B. Lippincott Co.—publication	$2,442.38	
Louis C. Hesse—labels	18.18	
W. L. Scoville—incidentals	3.53	
		$2,464.09
Transferred to A. Ph. A. Research Fund (Net income 1918)		1,976.49
Total		$4,440.58

II. Receipts.

Sales, quarter ending December 1, 1918 (balance)	$ 964.51	
Sales, quarter ending March 1, 1919	1,040.91	
Sales, quarter ending June 1, 1919	1,159.35	
Sales, quarter ending September 1, 1919	969.34	
Sales, quarter ending December 1, 1919	2,916.02	
Total remitted to Treasurer		$7,050.13

B. SUPPLEMENTARY REPORT.

RECEIPTS AND EXPENDITURES ON ACCOUNT OF NATIONAL FORMULARY IV.

JANUARY 1, 1920, TO MAY 1, 1920.

I. Expenditures.

J. B. Lippincott Co.—publication	$ 228.75	
Transferred to A. Ph. A. Research Fund (net income 1919)	2,226.77	
Total		$2,455.52

II. Receipts.

Sales, quarter ending March 1, 1920	$1,549.39	
Total remitted to Treasurer		$1,549.39

C. NATIONAL FORMULARY IV.—SUMMARY OF SALES.

March 1, 1919:

Bindings.	Copies Sold.	Price.	Amount.	
Muslin	475	$1.605	$762.375	
Buckram	138	1.935	267.03	
Interleaved	4	2.875	11.50	
Total	617		$1,040.91	
Remitted to Treasurer				$1,040.91

[1] Has been mailed.

June 1, 1919:

Bindings.	Copies Sold.	Price.	Amount.	
Muslin	525	$1.605	$ 842.625	
Buckram	179	1.935	346.365	
Interleaved	1	2.875	2.875	
Total	705		$1,191.865	
Less allowance for freight			32.52	
Remitted to Treasurer				$1,159.35

September 1, 1919:

Bindings.	Copies Sold.	Price.	Amount.	
Muslin	428	$1.605	$ 686.94	
Buckram	133	1.935	257.355	
Interleaved	12	2.875	34.50	
Total	573		$ 978.795	
Less allowance for freight			9.46	
Remitted to Treasurer				$ 969.34

December 1, 1919:

Bindings.	Copies Sold.	Price.	Amount.	
Muslin	1030	$1.605	$1.653.15	
Buckram	666	1.935	1,288.71	
Interleaved	4	2.875	11.50	
Total	1700		$2,953.36	
Less allowance for freight			37.34	
Remitted to Treasurer			$2,916.02	

March, 1, 1920:

Bindings.	Copies Sold.	Price.	Amount.	
Muslin	640	$1.605	$1,027.20	
Buckram	273	1.935	528.255	
Interleaved	6	2.875	17.25	
Total	919		$1,572.705	
Less allowance for freight			23.32	
Remitted to Treasurer			$1,549.39	

D. Complete Summary of Copies of N. F. IV. Printed and Bound By J. B. Lippincott Co. to April 1, 1920.

	Muslin.	Buckram.	Interleaved.	Unbound.	Total.
Series A	4,500	5,000	500		10,000
Series B	5,700	4,100	200		10,000
Series C	4,000	1,000			5,000
Series D	2,700	300			3,000
Series E	2,350	650			3,000
Series F	500	1,000		1,500	3,000
Totals	19,750	12,050	700	1,500	34,000

E. COMPLETE SUMMARY OF COPIES OF N. F. IV. RECEIVED AND SOLD BY THE MIDLAND PUBLISHING CO., TO MARCH 1, 1920.

Year.	Muslin.	Buckram.	Interleaved.	Total.
1916	7,993	7,279	487	15,759
1917	4,472	1,975	76	6,523
1918	2,750	493	8	3,251
1919	2,458	1,116	21	3,595
1920 (3 mo.)	640	273	6	919
Total sold	18,313	11,136	598	30,047
Stock at Midland Publishing Co., Mar. 1, 1920*	943	875	135	1,953
Total received	19,256	12,011	733	32,000
In transit	500			500
Total shipped	19,756	12,011	733	32,500
Unbound sheets				1,500
Total printed				34,000

F. TOTAL RECEIPTS FROM N. F. IV.

July 1, 1916, to March 1, 1920, Inclusive.

Year.	Amount.	
1916	$28,108.69	
1917	10,973.06	
1918	4,408.97	
1919	7,050.13	
1920 (3 mos.)	1,549.39	
Total		$52,090.24

G. ACCOUNT OF N. F. V.

Receipts: None.		
Expenditures:		
During 1919—Binders	$21.75	$ 21.75
During 1920—(1st 3 mos.):		
Stationery	68.75	
Postage	26.53	
Duplicator	25.00	
Total		$ 120.28
Grand total		$ 142.03

H. ACCOUNT OF PROCEEDINGS AND YEAR BOOKS.

Receipts—January 1, 1919, to December 31, 1919:		
Old editions of N. F	$ 2.55	
Bulletin	12.00	
Proceedings and Year Book	276.25	
Total		$ 290.80
Expenditures:		
Eschenbach Ptg. Co.—publication	$3,575.98	
H. V. Arny—journals	39.33	
W. B. Day—postage and express	9.58	
Total		$3,624.89

* Includes 48 complimentary copies.

I. Account of Badges and Bars.

January 1, 1919, to December 31, 1919, Inclusive.

Receipts from sale of badges and bars		$34.70
Expenditures—A. M. Fetting Co., 25 N. Y. Bars		39.38
Stock on hand April 1, 1920:		
Gold badges	9	
Gold bars	92	

J. Summary of Receipts.

January 1, 1919, to December 31, 1919.

Date of Remittance.	Badges and Bars.	Proceedings and Year Books.	N. F. IV.	Miscellaneous.	Total.
1919					
January 15		$ 2.50	964.51		$ 967.01
February 28		3.00		$ 1.20	4.20
March 8		4.00	1,040.91	12.00	1,056.91
April 30		17.35		7.50	24.85
May 31		7.60			7.60
June 6			1,159.35		1,159.35
July 2		43.60			43.60
July 31		6.00			6.00
September 8	$34.70	45.00	969.34		1,049.04
October 9		71.20			71.20
November 1		25.77			25.77
December 4		2.00	2,916.02		2,918.02
December 31		50.00		1.35	51.35
Total	$34.70	$278.02	$7,050.13	22.05	$7,384.90

K. Supplementary Report of Receipts.

January 1 to April 1, 1920.

Date of Remittance.	Proceedings and Year Books.	N. F. IV.	Miscellaneous.	Total.
1920				
January 30	$19.00			$ 19.00
March 3	46.20		$2.00	48.20
March 10		$1,549.39		1,549.39
March 31	10.00		1.50	11.50
Total	$75.20	$1,549.39	$3.50	$1,628.09

Respectfully submitted,

Wm. B. Day, *General Secretary.*

REPORT OF THE MEMBERSHIP COMMITTEE—1920.*

The Membership Committee, during the period which has elapsed since the last convention, has experienced the disadvantage of the short year between meetings, especially as it takes some time to get the new appointments made, the supplies distributed and the work started.

However, the response to the appeals of the chairman has been generously given and much credit is due to the district and state chairmen who have initiated membership campaigns in their respective territories. The result as a whole has been fairly satisfactory.

We have to report more than 500 new members so far elected during the *eight* months as compared with a total of 582 during *twelve* months last year. It is felt that with a long year coming, and the increased interest in the work shown by the committee-members and the better response of pharmacists generally, we shall be able to surpass all previous records during the next year and we hope to add one thousand new members to the Association.

Respectfully submitted,

Wm. B. Day, *Chairman Membership Committee.*

* Presented at City of Washington meeting, A. Ph. A., 1920.

REPORT OF THE COMMITTEE ON STATUS OF PHARMACISTS IN THE GOVERNMENT SERVICE.*

Your Committee has been in constant touch with the Surgeon-General's Office and with the Bureau of Medicine and Surgery of the Navy and also with the U. S. Public Health Service. Indeed, since arrival at this meeting your Committee has been accorded the courtesy of interviews with the Hon. Josephus Daniels, Secretary of the Navy, Major General Merritte W. Ireland, Surgeon-General of the Army, Admiral Washington, Chief of the Bureau of Navigation, and Admiral Braisted, Chief of the Bureau of Medicine and Surgery of the Navy. The present status of legislation may be summarized as follows:

The bill providing for the reorganization of the Army has incorporated in it a section providing for the establishment of a medical administrative corps composed of non-medical men with rank ranging from private to major. Commissions are to be issued in this corps only after three years' service as an enlisted man, one and a half years' service shall be as non-commissioned. This is the form in which the measure was passed by the Senate. The original measure provided for a five-year term of enlistment as a preliminary to the issuance of a commission and in this form it was passed by the House. Later, Surgeon-General Ireland requested that the preliminary service in the ranks be reduced to three years, and this was done in the Senate Bill, and it is hoped that in the joint conference bill the shorter term recommended by the Surgeon-General will be adopted.

It is understood, however, that the Surgeon-General will be given authority to recognize technical training covering the duties of the officer as a part of his preliminary service, even though that technical training may not have been received in the service.

The measure also provides for special training schools somewhat along the lines which have been carried on by the Navy for the training of the personnel of the Naval Hospital Corps.

The measure also provides for the establishment of a reserve corps in which men will be given commissions in accordance with their technical qualifications and standing, and in which it is hoped to enroll a number of specialists covering pharmacy and other technical fields of service who will be required in the administrative corps. Men of the highest attainment will be invited to join this reserve corps and in organizing the administrative corps; we are informed that it is intended to request men who have seen active service to apply for active duty for a few months, or for so long a time as they can spare, in order to be of aid to the Surgeon-General in the organization of this administrative corps.

Surgeon-General Ireland expressed himself as having been highly pleased with the work done by the pharmacists who occupied responsible positions during the war in the Division of Supply and Distribution, and it is to be hoped that some of the leaders among these men who made such a good record for pharmacy may be induced to apply for active duty and assist in the organization of the administrative corps.

The Darrow Bill has been referred to the Committee on Naval Affairs and it remains to be seen whether this measure will be reported favorably. The bill has been amended in several particulars and, as it now stands, provides for a continuation of the commissioned rank given to senior pharmacists in the Navy during the war for a term of two years. The proposal to establish a separate commissioned corps of pharmacists has met with objection in some quarters, and it seemed improbable that this step would be taken at this time, but the proposal to continue the present officers of their advanced rank seems not to meet with opposition, and we have every hope that it will be favorably reported.

In neither the Army nor the Navy have we prospects of obtaining exactly what we desire nor quite all that we would like to have for pharmacists in the service, but the concessions made put the pharmacists in a wholly new light and show that the services rendered by the educated pharmacists during the war have made an impression upon the Naval and Military authorities.

So many and such varied factors are involved in introducing a change of procedure in such matters that your Committee is of the opinion that we may esteem ourselves fortunate to

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* In the absence of Chairman E. Fullerton Cook, presented by Caswell A. Mayo to General Session, A. Ph. A., City of Washington meeting, 1920, and accepted.

have won the degree of recognition which the authorities now accord and which is reflected in the form of the bills now before Congress.

Prophecy as to what will happen to a measure in the hands of a Congressional joint committee is idle and useless. What the outcome will be no man can know, for at the last minute some radical change may be made as a result of a compromise. In fact nearly all legislation is in the nature of a compromise. We can only say, that we hope that the measure will be enacted somewhat along the lines set forth above and that we have good grounds for this hope. Certainly there has been a marked change in the attitude of the Surgeon-General of the Army toward the pharmacists since the time when delegations of pharmacists from this Association were told that "the Army had no need for pharmacists."

Your Committee is convinced that everything has been done that can be done to accelerate the passage of the measure, and that it would be unwise to endeavor to bring any pressure to bear on Congress in this matter.

The pharmacists in the U. S. Public Health Service have not fared so well as those of the Army and Navy during the war, for they should, at least have had temporary advancement of rank. But the pharmacists of the U. S. Public Health Service are still in the same status that they occupied before the war, though they have been performing active and important duties.

CASWELL A. MAYO,
GEORGE M. BERINGER,
WM. B. DAY,
F. G. EBERLE,
E. FULLERTON COOK, Chairman,
Committee.

The late Prof. Henry Trimble, comfortably seated in an oak, New Orleans meeting of American Pharmaceutical Association, in 1891. The photograph was taken by Prof. A. B. Stevens, then Vice-President of the A. Ph. A. and presented to the Section on Historical Pharmacy by S. L. Hilton.

NOMINEES FOR OFFICERS OF AMERICAN PHARMACEUTICAL ASSOCIATION FOR 1921–1922.

Secretary William B. Day will soon mail out the ballots for the election of A. Ph. A officers for 1921–1922. The nominees are:

For President, Henry Kraemer, Michigan; C. W. Johnson, Washington State, S. L. Hilton, District of Columbia.

For First Vice-President, Frank Schachleiter, Arkansas; Charles Caspari, Missouri; Wilber J. Teeters, Iowa.

For Second Vice-President, C. E. Anding, Mississippi; D. F. Jones, South Dakota; W. J. Cox, Tennessee.

For Third Vice-President, Hugo Schaefer, New York; W. H. Zeigler, South Carolina, R. W. Terry, Ohio.

For Members of the Council, Henry M. Whelpley, Missouri; George M. Beringer, New Jersey; J. G. Godding, Massachusetts; C. B. Jordan, Indiana; Edward Spease, Ohio; C. H. Packard, Massachusetts; Willis G. Gregory, New York; C. E. Mollett, Montana; Mathias No l, Kansas. Three to be elected.

EDITORIAL NOTES

Editor: E. G. EBERLE, Bourse Building, Philadelphia, Pa.

Committee on Publication: J. W. ENGLAND, *Chairman;* CASWELL A. MAYO, H. B. MASON, E. L. NEWCOMB, CLYDE L. EDDY, and the Editor-in-Chief of the JOURNAL, General Secretary, Treasurer and Reporter on the Progress of Pharmacy, *ex-officio.*

Collaborators: C. HERBERT PACKARD, President, A. Ph. A.; WILBER J. TEETERS, President, A. C. P. F., H. C. CHRISTENSEN, Secretary, N. A. B. P., E. FULLERTON COOK, Chairman, U. S. P. Revision Committee; CHARLES H. LAWALL, Chairman, Council A. Ph. A. The Chairmen of the Sections A. Ph. A.: A. G. DUMEZ, IVOR GRIFFITH, EDWARD SPEASE, CHARLES O. LEE, CURT P. WIMMER and E. F. KELLY.

The Editor is indebted to Dr. F. B. Power for calling attention to several errors in the sketch of Prof. H. G. Greenish, July issue, pp. 663–666. Thomas Greenish, the father of H. G. Greenish, was President of the British Pharmaceutical Conference in 1880–1881, not the subject of the sketch; the error occurs on pp. 663 and 665. Doctor Power also corrects the statement that the Hanbury Memorial was founded in 1882; Prof. Flückiger was the first medalist, in 1881; "eighteen awards have been made" should read "*nineteen* awards have been made."

The inadvertent errors are regretted, and we thank Dr. Power for calling our attention to them.

CHEMISTRY OF RHUBARB.

Tschirch states that the value of rhubarb depends upon the presence of anthraquinone derivatives, particularly emodins, which act as a purgative even in small doses, and upon the characteristic smell of the drug, due to the presence of rheosmin, which is peculiar to the Chinese drug, especially to the rhizomes of *Palmatum* varieties. The presence of anthraquinone can be demonstrated by the test included in the Swiss Pharmacopoeia: 0.01 Gm. of rhubarb boiled with 10 Cc. of potassium hydroxide yields a filtrate which on being slightly acidified by the addition of hydrochloric acid and immediately shaken with 10 Cc. of ether imparts a yellow color to the latter. If the ethereal solution is shaken with 5 Cc. of ammonia, the latter is colored cherry-red (emodin) and the ether remains yellow (chrysophanic acid).—From *Chemist and Druggist,* June 5, 1920.

THE DRUG TRAFFIC.

Quoting the *Seattle Post Intelligencer* of July 22, "The China Club of Seattle has undertaken an important work in arousing public sentiment against the traffic in narcotic drugs. The task which the club has set for itself appears at first to be so great that success must be far off, yet it may be taken for granted that once the American people are fully informed concerning the devious routes of narcotics from the hands of the manufacturer to the unfortunate consumer, the demand for restrictive legislation will be so great that its enactment will come quickly. Once the United States can show clean hands, the task of getting other governments to coöperate in the suppression of the nefarious trade will be made much easier."

The *London Times* recently published a scathing indictment of the opium and morphine traffic in China. Quoting their Peking correspondent in this article, as printed in the *Chemist and Druggist:* "Official records show that during the first ten months of 1919 there were imported into the United States 250 tons of crude opium, which manufactured in the ratio of seven to one represents 35 tons of morphine and other noxious drugs. Statistics prove that one ton of morphine should suffice for the annual medicinal needs of all the Americas from Alaska to Patagonia, and it is notorious that practically the whole of the opium entering America reaches China in one form or another. The American action does not affect the trans-American morphine trade between Great Britain and the Far East. Direct export of morphine to China is forbidden except when it is certified as for medicinal purposes, but there are no restrictions on export to America, with the result that huge quantities are passed through that country in bond, shipped to Japan, and there trans-shipped without landing for Tsingtao, Dalny, and Korea. From the first two-mentioned places it is smuggled directly into the interior, and from Korea by a regular system of motorboats it is clandestinely distributed

along the northern coasts of China. One ton of morphine is equivalent to 32,000,000 injections, so it may be imagined what havoc is being done in this unfortunate country by the traffic. Although import into China has been forbidden by treaty since 1916, it is the fact that Indian opium continues to pour into China by hundreds of tons. It is exported from India to Malaya, the Dutch Indies, and Macao in quantities vastly in excess of local requirements, and it is re-exported to Korea, Japan and Japanese ports in China, and from there smuggled into the interior of China. Sir Francis Aglen, Inspector-General of Chinese Maritime Customs, speaking recently at an international anti-opium meeting in Peking, stated that the Customs, during 1919, had seized 21 tons of opium and 4 cwt. of morphine, heroine, etc., figures which represented 'only an infinitesimal fraction of what is actually coming into the country.' Thus, not only are the morphine regulations evaded with complete success, but the whole British policy in regard to the Indian opium trade is being stultified. China is backsliding in the matter of internal cultivation, and the demand of the Chinese for foreign opium and its derivatives is insistent. No regulations will keep either opium or morphine out of China so long as these commodities exist elsewhere in the world. Responsibility for a situation which is resulting in the wholesale process of debauching an unsophisticated Oriental people clearly lies in two places—upon the Japanese, who do nearly all the smuggling, and upon us, the British, who permit a growth of opium in India vastly in excess of the local consumption, and who allow our own nationals to manufacture morphine and other pernicious drugs in a quantity thousands and thousands percent beyond the legitimate medical requirements of the whole world. It is a dirty trade all through, and for our own prestige, if not for conscience' sake, we ought, without further circumlocution, to strangle it at the root by stopping production in India."

THE PREVENTION OF TETANUS.

The French correspondent of the *Chemist and Druggist* states that experiments made by MM. Heim, Fernbach and Rullier on rabbits and mice seem to indicate that the development of tetanus and gas gangrene in textiles can be retarded, and even prevented, by suitable antiseptics. The most effective appears to be hydrofluosilic acid $7\frac{1}{2}$ percent, alone, or mixed with $\frac{1}{4000}$ of sublimate or a first impregnation of the $7\frac{1}{2}$ percent acid, followed by a second treatment in which 5 percent coal oil is mixed with the $\frac{1}{4000}$ sublimate. These experiments, made some time ago, were not divulged while hostilities lasted, and they are not conclusive. They may, however, suggest ideas for the treatment of the uniforms of combatants.

U. S. BUREAU OF STANDARDS FIXES TEASPOONFUL AT 5 Cc.

The Bureau of Standards has fixed five cubic centimeters as the theoretical quantity of a teaspoonful.

CHICAGO CITY COUNCIL ENDORSES METRIC SYSTEM.

By unanimous vote the City Council of Chicago, Illinois, has adopted a resolution urging that the United States of America and the British Commonwealths adopt the metric system of weights and measures as the exclusive legal standard.

NEWS ITEMS FROM THE NATIONAL RESEARCH COUNCIL.

(From the Secretary's Office, 1201 Sixteenth St. Washington, D. C.)

INDUSTRIAL RESEARCH LABORATORIES IN AMERICA.

A bulletin just issued by the National Research Council lists more than three hundred laboratories maintained by industrial concerns in America, in which fundamental scientific research is carried on. The bulletin gives a brief account of the personnel, special equipment and particular kind of research carried on in each of the laboratories listed.

Industrial research laboratories have increased notably in number and activity, both in America and Great Britain, since the beginning of the War, because of the lesson vividly taught by the war emergency. It was only by a swift development of scientific processes that the Allies and America were able to put themselves in a position first to withstand and then to win a victory over Germany's science—backed armies and submarines. And it is only by a similar and further development that America and the Allies can win over Germany in the economic war-after-the-war, now being silently but vigorously waged.

PLANT PROTECTION INSTITUTE.

With the advice and assistance of the National Research Council, a coöperative body of scientific experts on injurious insects and plant diseases and of manufacturers of insecticides, fungicides and general chemicals and apparatus used in fighting the enemies of field and orchard crops, has just been organized under the name of the Plant Protection Institute. The purpose of the institute is to promote the general welfare by supporting and directing scientific research on the pests of crops, shade trees and ornamental plants, and on the methods of their control, and by furthering coöperation between the scientific investigators and the manufacturers of chemicals and appliances, especially for the sake of effecting standardization and economy in the production and use of the means of fighting pests. Also it expects to aid in the dissemination of scientifically correct information regarding the control of injurious insects and plant diseases.

Much excellent work along this line is now being done by government and state organizations, but a further advance can be made by introducing a wider coördination and cooperation of the efforts of both the scientific men and the manufacturers of control devices. It is in this general direction of coöperative work that the Plant Protection Institute expects to be most active.

DUPLICATE REPORTS AVAILABLE.

The Department of Registration and Education of the State of Illinois, Springfield, Illinois, has one copy each of the following duplicate reports which it will be glad to send to any one interested in completing a file:

Proceedings, Missouri Pharmaceutical Association, 1904.

Thirty-fifth Annual Report of Commissioners of Pharmacy of New Hampshire, 1910.

Third Annual Report of New York State Board of Pharmacy, 1903.

Seventeenth Annual Report, Wisconsin Board of Pharmacy, 1898.

Oregon Board of Pharmacy, 1909.

Forty-first Annual Report of Rhode Island Board of Pharmacy, 1911.

Proceedings Missouri Pharmaceutical Association, 1905.

Twenty-eighth Annual Report of Louisiana State Board of Pharmacy.

Iowa Commissioners of Pharmacy.

Address Francis W. Shepardson, Director of Registration and Education, Springfield, Ill.

TOXIC PROPERTIES OF MILK.

In an abstracted report the *Journal of the American Medical Association* states that milk heated to 80° or 85° C. for twenty to thirty minutes and kept at 37° C., decomposes with the elaboration of definite poisonous substances, a fact which, Ford says, should be kept clearly in mind in the consideration of the problem of milk pasteurization; and, under all circumstances, milk heated to temperatures sufficient to destroy vegetative bacteria but not their spores should be kept at a low temperature to prevent the development of these spores and should be used within a brief interval after the heating. Whether the bacterial products found in this decomposed milk have any poisonous action when taken into the digestive tract has not been determined, but in view of their presence in milk the practice of keeping pasteurized milk for any considerable period of time before using is condemned strongly by the authors. Finally the occurrence of toxic substances in heated milk arising from the development of spore-bearing bacteria requires a rigid supervision of milk production before pasteurization to prevent the entrance of organisms of this character.

THE COST OF DELIVERY.

Druggists do not, as a rule, pay enough attention to the cost of delivery; a large percentage of these deliveries reduce the profit or increase the overhead, and, in some instances, there is no profit when account is made of this expense. The National Dry Goods Association recently determined from a questionnaire, that the average cost of delivering a package is twelve cents.

SHORTAGE OF DOCTORS.

An editorial of the *Columbus Dispatch* states that "the shortage of doctors is felt more keenly in the country than in the city. In fact, the country doctor is disappearing and the people of rural communities are suffering from lack of medical attention. There are any number of prosperous towns and rich agricultural communities in this state that have no local doctor at all; others where only the old practitioners have been left to look after

the health of the people. The automobile helps to take care of the situation, in that it is now possible for a physician to cover a much wider territory than formerly, and to attend to many more patients. But even discounting the increased efficiency due to the automobile, the situation is still alarming. "* * * the real cause of the shortage is the fact that there are not enough students in the medical colleges—not enough doctors being graduated every year. This is partly due to the fact that the requirements for entering the colleges have been advanced and the terms lengthened. One must now spend several years at college before he can enter a medical college; then he must put in four years before he can practice. Eight or ten years at least must a young man put in schools and colleges before he can hope to be self-supporting at the practice of medicine, and that is a greater length of time than many are willing to sacrifice. It is all in the interest of science, we are assured, and it may be that it is. But if science continues to lengthen terms at school and to hedge about the young man with other requirements, then we are all going to die because of too much science."

Town Gossip, July 24, 1920, says:

"It's going to be a tight squeeze for a man to get a medical education in California. Five medical schools have gone out of existence within the past year or two. There now remain only three medical schools—University of California Medical Department; Leland Stanford, Jr. University School of Medicine, and College of Medical Evangelists, Loma Linda. Leland Stanford provides in its medical school for all its pre-medical graduates from the academic departments, and in a pinch could take in an 'outsider' (male). At U. C. about 110 students completed the pre-medical courses in the academic departments in 1920. Of this number only 65 could be accommodated at the U. C. Medical School. In August, 1922, the pre-medical requirement at U. C. will be raised from two to three years. On this basis a student will be close to thirty years of age before he starts out to practice medicine."

An editorial *Journal A. M. A.* August 7, 1920, reads: "There is no scarcity of physicians so far as numbers are concerned, and the supply of better qualified medical men is being rapidly increased. Meanwhile, as shown by the statistics published this week (August 7), the pendulum is swinging back and the numbers of both medical students and graduates show marked increases over the previous year. It is satisfactory to know, however, that the increased quantity represents also an improved quality from the standpoint of both preliminary and professional education.

PERSONAL AND NEWS ITEMS.

Dean Henry Kraemer, one of the nominees for president of the American Pharmaceutical Association, has resigned his position at the University of Michigan, due to impaired health. Professor Kraemer states that complete rest for an extended period has been advised. It is to be hoped that he will soon be restored to health and be able to resume his labors.

Caswell A. Mayo, of the William S. Merrell Chemical Co., has been appointed dean of the Queen City College of Pharmacy, Cincinnati, O. He succeeds Dr. Frank Cain, who gave notice of his resignation some time ago in order that he might give more of his time to his medical profession. Mr. Mayo is ex-president of the American Pharmaceutical Association.

Harrison E. Patten, formerly in charge of the physical chemistry laboratory of the Bureau of Chemistry, Department of Agriculture, has resigned his position with the government to accept the position of chief chemist with a firm in St. Louis. Dr. Patten has been connected with the Department of Agriculture for 14 years, during which time he has been engaged in laboratory work in connection with analyses of drugs and food, and has also written many articles on chemistry, physics, and electrochemistry. During the war he was a major in the Quartermaster Department of the Army.

O. F. Fuller recently celebrated his ninety-first birthday, surrounded by his old-time Chicago friends in the Chicago Veteran Druggists' Association, of which he is the honorary life president. He was honorary president of the American Pharmaceutical Association, 1918–1919.

Matt Noll, senior member of the Kansas State Board of Pharmacy, has retired from the retail drug business in Atchison. He conducted the store, which he sold, for thirty-five years.

H. M. Lerou, retail pharmacist of Norwich, Conn., has been elected Mayor of his home city.

Benjamin Edmunds, for several years secretary and active in the editorial management of the *Journal* of the Detroit Retail Druggists' Association, has resigned to engage in other work.

Prof. Charles T. P. Fennel has recovered from a serious illness and is enjoying an extended vacation in Colorado.

W. Bruce Philip has been chosen permanent secretary of the San Francisco Retail Druggists' Association. Under the guidance of Mr. Philip, valuable information for the retail druggists of northern and central California is provided. The weekly letters issued by these bodies are of value, and should be suggestive for organizations in other states.

Dean O. C. Dilly has been appointed a member of the Kentucky State Board of Health by Governor Morrow.

Louis Emanuel has sold his store and retired from active business. He conducted this store for forty-four years. Mr. Emanuel is a member of the Pennsylvania State Board of Pharmacy and active in State and National Associations.

Miss Irene C. Diner, daughter of Dr. Jacob Diner, has made a discovery whereby the standardization of commercial rubber is made possible. The elasticity and tensile strength of rubber, it is said, will be more easily regulated and the whole field of rubber uses vastly improved. Though only twenty-two years old, Miss Diner holds the degrees of A.B., M.A., and Ph.D.

Charles G. Merrell, president of William S. Merrell Company, was presented by the employees of this firm with a Rockwood Plaque, showing a Summer Idyl in pastel tones, painted by E. Dries. The presentation was made at a recent outing given by the firm to its employees.

Mrs. Fletcher Howard, for many years a member of the American Pharmaceutical Association, and also during her husband's life-time a regular attendant at the annual meetings, died in Los Angeles, June 19, 1920, after a lingering illness, following a stroke of paralysis. She was deeply interested in pharmacy and association work, both state and national. In a communication to the American Pharmaceutical Association in convention at Washington, she expressed her regret because of enforced absence, and extended "best wishes for a most interesting and profitable session." Letters of sympathy were sent to her by the Association and the Women's Section, A. Ph. A. The body was taken to Des Moines, Ia., her former home, for burial.

SOCIETIES AND COLLEGES.

TWENTY-SECOND ANNUAL CONVENTION OF THE NATIONAL ASSOCIATION OF RETAIL DRUGGISTS IN ST. LOUIS, SEPTEMBER 20–24.

The Twenty-second Annual Convention of the National Association of Retail Druggists will convene in St. Louis, September 20–24; the sessions will be held in Planters' Hotel.

It is needless to comment on the importance of this national association in the affairs of retail druggists. The splendid work accomplished by this organization as a body and coöperatively with other associations is of record, and it remains for druggists to give more of their support in order to accomplish greater things. The complexity of the drug business requires the activities of a number of organizations, the foundation of which is in the State associations.

In a letter sent out to the press, O. J. Cloughly presents a number of interesting events and data from which we quote.

The N. A. R. D. was organized in St. Louis, October 17, 1898, and the annual convention was last held in St. Louis in 1904 during the Louisiana Purchase Exposition. It is now returning to St. Louis for its Twenty-second Annual Convention.

Among the important matters to be discussed will be national legislation, and the druggists' responsibilities thereunder, with an explanation of the details in keeping proper records in compliance with the numerous exactions, more particularly relating to prohibition and narcotic laws.

The entire second floor of the hotel will be devoted to exhibits of seventy-five or more leading manufacturers of proprietary and drug sundries. This in itself will be quite worth while, as it will afford druggists an opportunity of studying and becoming acquainted with the marketable merchandise in a way that it would be impossible for them to do otherwise.

Druggists have responsibilities and obligations to the community in which they are doing business, important to the health and welfare of their respective communities, and at the convention will be shown how they can best meet these obligations and command the respect and appreciation which their position merits. William H. Lamont, chairman of the Trade Interests Committee, has outlined a unique program for this department; he will treat the subject under "A Day in a Model Drug Store." Every phase which makes up a day in a druggist's business life will be shown, from the opening of the store, filling of prescriptions, window displays, writing of advertising copy, to the figuring of costs and solving problems concerned with laws.

There will be a display of drug plants, arranged by the St. Louis College of Pharmacy in coöperation with the Missouri Botanical Gardens, under the direction of Dr. H. M. Whelpley, who has also provided for an historical exhibit. Entertainments will fill every leisure moment, and special programs have been arranged for the ladies.

SIXTH NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES, NEW YORK CITY, SEPTEMBER 20-25.

With 370 applications for exhibits already booked, the Sixth National Exposition of Chemical Industries will be on a record-breaking scale. The exposition has become an institution in the United States and each year finds new displays that further reveal the ingenuity and cleverness of this country's chemists.

There will be a wide range of exhibits this year. The fact that the exposition has been divided into sections has caused greater interest than ever. From huge vacuum and drying plants, weighing tons, to the most minute apparatus used in laboratory experiments, the exposition will be complete. Exhibitors will show how the pharmaceuticals and medicinals essential to the industry are now made in America.

During its five years of exhibitions the chemical show has grown into an educational institute of the first magnitude for the chemist, the chemical engineer and the student of chemistry. For the business man it is a means of enlightening him and enabling him to see things at close range that he uses in his manufacturing, but seldom comes in close contact with, while for the general expansion of trade the expositions are a factor of great magnitude.

AMERICAN CHEMICAL SOCIETY MEETS IN CHICAGO SEPTEMBER 7-10.

Edgar B. Carter, secretary of the Division of Pharmaceutical Chemistry of the American Chemical Society, is soliciting papers for this division in which pharmacists are more particularly interested. The increased interest in the chemistry of medicinal products should make this one of the most important divisions of the American Chemical Society. The general attendance promises to be large.

ANNUAL MEETING OF THE DIVISION OF CHEMISTRY AND CHEMICAL TECHNOLOGY, NATIONAL RESEARCH COUNCIL.

There were present at the annual meeting of above-named Division of the National Research Council, the following: Messrs. Alsberg, Bancroft, Bleininger, Derick, Fink, Francis, Johnston, Lamb, Moore, Noyes, Stiglitz, Washburn; and by invitation, Messrs. Angell, Christian, Cottrell, Kellogg, Mendenhall, Munroe and Yerkes.

The following officers were elected for the ensuing year: Vice-Chairman, Julius Stiglitz; Members-at-Large, A. A. Noyes and E. W. Washburn. The members of the Executive Committee will be the chairmen and vice-chairmen, C. L. Alsberg, A. B. Lamb, John Johnston, and W. D. Bancroft, *ex-officio*, retiring chairman.

In presenting the report of the Committee on Synthetic Drugs, Julius Stieglitz, chairman, pointed out the valuable work done by this committee in furnishing information and advice to manufacturers. The committee on request had acted in advisory capacity to the Chemical Foundation, which controls most of the important formerly foreign-owned patents. The committee was convinced that real service could be rendered, particularly to the organic chemical industries, through the existence of such a committee of unbiased men of scientific training and of experience in public affairs without any trade interests.

OFFICERS OF STATE PHARMACEUTICAL ASSOCIATIONS, 1920–1921.

(Secretaries of associations are asked to make corrections and send in list of officers, and name of next convention city.)

ARKANSAS.

President, Ex-Col. William G. Ownbey, Springdale.
First Vice-President, S. V. Bracey, Little Rock.
Second Vice-President, P. D. Vincent, Texarkana.
Secretary-Treasurer, Miss Mary A. Fein, Little Rock.

CALIFORNIA.

President, C. W. Hartsough, San Diego.
First Vice-President, A. L. Hawkins, Pasadena.
Second Vice-President, W. A. Wishart, Oakland.
Secretary-Treasurer, Edward A. Henderson, Los Angeles.
Yosemite Valley was chosen for the meeting of 1921.

COLORADO.

President, L. A. Jeancon, Denver.
First Vice-President, Walter F. Meyer, Colorado Springs.
Second Vice-President, H. C. Washburn, Boulder.
Secretary, Charles J. Clayton, Denver.
Treasurer, C. D. Smith, Grand Junction.

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President, George W. Rhodes, Newark.
First Vice-President, James T. Challenger, New Castle.
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Third Vice-President, William H. Chambers, Lewiston.
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President, David G. Wise, Atlanta.
First Vice-President, Jabe Stamp, Thomaston.
Second Vice-President, Herbert C. Shyptrine, Savannah.
Third Vice-President, R. E. Perry, Sylvania.
Secretary, T. A. Cheatham, Atlanta.
Treasurer, T. C. Marshall, Atlanta.

ILLINOIS.

President, William J. Clancy, LaSalle.
First Vice-President, Ad. Umenhofer, Chicago.
Second Vice-President, Fred W. Rauth, Springfield.
Third Vice-President, Samuel L. Antonow, Chicago.
Secretary, William B. Day, Chicago.
Treasurer, George M. Bennett, Urbana.

KANSAS.

President, Nathan G. Edelblutt, Topeka.
First Vice-President, W. H. Lightstone, Sr., Arkansas City.
Second Vice-President, Otto Rommell, Waterville.
Secretary, D. F. Deem, Stark.
Asst. Secretary, Lee Tully, Topeka.
Treasurer, John Schmitter, Gypsum City.
Librarian, Prof. L. E. Sayre, Lawrence.

KENTUCKY.

President, James F. Wilson, Mayfield.
Secretary, J. W. Gayle, Frankfort.
Treasurer, Vernon Driskell, Carrollton.
Chairman Executive Committee, Fred Otterbach, Louisville.
Place of next meeting will be Crabtree, Ky.

LOUISIANA.

President, W. N. Wilson, Independence.
First Vice-President, Christian Schertz, New Orleans.
Second Vice-President, John W. Collins, Monroe.
Secretary, George W. McDuff, New Orleans.
Treasurer, Dr. George S. Brown, New Orleans.
Corresponding Secretary, Harry J. Bourgeois, Morgan City.

MARYLAND.

President, George E. Pearce, Frostburg.
First Vice-President, R. E. L. Williamson, Baltimore.
Second Vice-President, C. L. Meyer, Baltimore.
Third Vice-President, W. K. Edwards, Cumberland.
Secretary, E. F. Kelly, Baltimore.
Treasurer, S. Y. Harris, Baltimore.

MASSACHUSETTS.

President, A. J. H. Paquette, Lynn.
First Vice-President, William H. Glover, Lawrence.
Second Vice-President, Timothy J. Sea, Worcester.
Secretary, James F. Guerin, Worcester.
Treasurer, John J. Tobin, Boston.

MICHIGAN.

President, J. A. Skinner, Cedar Springs.
First Vice-President, G. S. Barnard, Benton Harbor.
Second Vice-President, J. H. Weisel, Monroe.
Secretary, F. J. Wheaton, Jackson.
Treasurer, Karl H. Wheeler, Grand Rapids.

MINNESOTA.

President, E. L. Newcomb, Minneapolis.
First Vice-President, Harry Trowbridge, Austin.
Second Vice-President, C. C. Diessner, Wakenia.
Third Vice-President, Theodore A. Arneson, Montevideo.
Secretary, Gustav Bachman, Minneapolis.
Treasurer, R. J. Hessing, St. Paul.
Place of next meeting, St. Paul.

MISSISSIPPI.

President, S. M. Covington, Summit.
First Vice-President, H. M. McAmis, Corinth.
Second Vice-President, P. K. Thomas, Tupelo.
Secretary-Treasurer, A. S. Coody, Jackson.
Jackson was selected for the 1921 meeting.

MISSOURI.

President, Charles H. McDonald, Rocky Comfort.
Honorary President, H. C. Churchill, Windsor.
First Vice-President, Robert Lisch, Springfield.
Second-Vice President, William E. Bard, Sedalia.
Third Vice-President, M. J. Ulber, Kansas City.
General Secretary, Henry M. Whelpley, St. Louis.
Treasurer, William Mittelbach, Boonville.
Place of next meeting, Excelsior Springs.

NEBRASKA.

President, G. Turner Haines, Omaha.
First Vice-President, T. G. Slater, Hordville.
Second Vice-President, J. H. Thompson, West Point.
Third Vice-President, J. V. Deines, Fairfield.
Fourth Vice-President, J. U. Malick, Bloomington.
Fifth Vice-President, W. R. Wright, Callaway.
Secretary, J. G. McBride, University Place.
Treasurer, D. D. Adams, Nehawka.
Place of next meeting, Columbus.
A. V. Pease, Fairburg, D. J. Fink, Holdrege, and S. C. Wilson, were elected to life membership, having attended every annual meeting for 32, 33 and 34 years, respectively. The local committee paid the fare, up to 200 miles, of one representative in attendance from each drug store.

NEW HAMPSHIRE

President, S. H. Whiting, Raymond.
First Vice-President, J. R. Kelley, Newport.
Second Vice-President, A. C. Bourque, Nashua.
Secretary, Eugene Sullivan, Concord.
Treasurer, S. Howard Bell, Derry.
Auditor, J. H. Marshall, Manchester.

NEW JERSEY.

President, Harry W. Crooks, Newark.
First Vice-President, E. T. N. Stein, Montclair.
Second Vice-President, Alexander Seidler, Newark.
Secretary, Jeannot Hostmann, Hoboken.
Treasurer, Edgar R. Sparks, Burlington.
Local Secretary, Daniel H. Hills, Spring Lake.
Spring Lake was chosen for the 1921 convention.

NEW YORK.

President, Robert S. Lehman, New York City.
First Vice-President, Herbert G. Wright, Syracuse.
Second Vice-President, Arthur H. Reimann, Buffalo.
Third Vice-President, Mendel Zagat, New York City.
Secretary, E. S. Dawson, Syracuse.
Treasurer, Frank Richardson, Cambridge.

NORTH CAROLINA.

President, E. E. Missildine, Tryon.
First Vice-President, I. W. Rose, Rocky Mount.
Second Vice-President, J. A. Goode, Asheville.
Third Vice-President, P. A. Lee, Dunn.
Secretary-Treasurer, J. G. Beard, Chapel Hill.
Charlotte, N. C., was selected for next convention. This is to be a joint meeting with the South Carolina Association.

PENNSYLVANIA.

President, W. J. Sturgeon, Kittanning.
First Vice-President, W. B. Goodyear, Harrisburg.
Second Vice-President, J. N. G. Long, Philadelphia.
Secretary, Louis Saalbach, Pittsburgh.
Treasurer, F. H. E. Glein, Lebanon.
Local Secretary, Ambrose Hunsberger, Philadelphia.
Place of next meeting, Philadelphia.

TEXAS.

President, W. C. Burns, San Antonio.
First Vice-President, W. Arthur Skillern, Dallas.
Second Vice-President, J. W. Collins, Amarillo.
Third Vice-President, W. H. Wentland, Manor.
Fourth Vice-President, W. G. Willman, Brownsville.
Secretary-Treasurer, W. H. Cousins.
Home Secretary, J. W. Graham, Austin.
San Antonio was selected for the next place of meeting.

UTAH.

President, Charles E. Driver, Ogden.
First Vice-President, Harry Coombs, Salt Lake City.
Second Vice-President, Ed. Johnson, Mt. Pleasant.
Secretary, Edwin C. Smith, Salt Lake City.
Treasurer, George Huscher, Murray.
Logan was selected for the 1921 meeting.

WEST VIRGINIA.

President, Ivan S. Davis, Huntington.
First Vice-President, F. C. Kramer, Parkersburg.
Second Vice-President, E. S. Bradley, Bluefield.
Third Vice-President, P. A. George, Ronceverte.
Secretary-Treasurer, P. H. Kelly, Montgomery.
Parkersburg was selected for the 1921 meeting.

THE PHARMACIST AND THE LAW.

THE TAXATION SPREE.

The *Philadelphia Ledger* says in an editorial:

"Incontrovertible proof that the government of the United States is engaged in a taxation orgy is furnished by the Treasury Department's report for the fiscal year ended on June 30 last. During twelve months of peace the federal income exceeded federal expenditures, extravagant as they have been, by more than $291,000,000. The tax collected was 25 percent greater than that of either of the war years and surpassed the official estimates by about $300,000,000.

"Preposterous indeed, therefore, is the financial burden which clumsy and ill-digested legislation has compelled the American people to bear.

"The duty of Congress can no longer be obscured by the greed of overfed federal departments or wasteful plans to consume the surplus.

"Needful taxation in war time is unpleasant, as is all sacrifice, but the patriotism and philosophy of the nation are hardy in a crisis. Oppressive and superfluous assessments in peace are of the nature of outrage.

"There is some palliation for congressional negligence during the last session. It miscalculated on the federal income and underestimated, in the absence of facts now demonstrated, the amount of imperative expenditures. But such excuses will possess no future authority.

"The taxation monstrosity must be reformed, revised, emphatically reduced.

"A gluttonous Uncle Sam is the least engaging of national emblems."

PREREQUISITE IN THE PHARMACY LAW OF MISSISSIPPI.

Section 22 of the Mississippi Pharmacy Law reads:

"By a 'recognized college,' as used in this Act, is meant a college holding membership in the American Conference of Pharmaceutical Faculties."

The amended Sections are Nos. 1, 2 and 3; they read:

"Section 1. Registered pharmacists, in the meaning of this Act, shall comprise all persons who have secured license to practice pharmacy prior to the passage of this Act, and all persons over the age of twenty-one years who are graduates of a recognized school or college of pharmacy, and who shall be of good moral character and shall pass a satisfactory examination before the State Board of Pharmacy.

"Section 2. Assistant pharmacist in the meaning of this Act, shall comprise all persons over the age of nineteen years, who shall have

had not less than two years' practical experience in a store where physicians' prescriptions are compounded and dispensed, and who shall pass a satisfactory examination before the State Board of Pharmacy. An assistant pharmacist shall not be permitted to conduct or manage a pharmacy, store or shop on his own account or assume the management of such business for others, except during the temporary absence of the registered pharmacist for a period of not longer than ten days.

"Section 3. That this Act take effect and be in force from and after January 1st, 1921."

THE REMEDY FOR VICIOUS AND MEDDLESOME LEGISLATION.

Dr. J. H. Beal closed his address before the recent meeting of Illinois State Pharmaceutical Association by giving his answer to the question, "Is there any remedy for the flood of emotional, unnecessary and meddlesome legislation with which the present age is afflicted?" "As Mark Twain said about improving the weather, 'Everybody talks about it, but no one does anything.'

"The one and only true remedy for excessive and meddlesome legislation is public opinion enlightened in the following particulars:

"(1) A better understanding of the plan and purpose of the original American constitutional system, and the historical reasons for the limitations upon legislation found therein.

"(2) A better understanding of the fact that law is not all powerful in curing social and economic evils, and that many are best cured without it.

"(3) A better understanding of the fact that excessive law-making promotes excessive law-breaking.

"(4) A better understanding of the fact that when any comprehensive and well considered measure has once been placed upon the statute books it should not be amended except upon the plainest possible proof that the amendment will work more efficiently than the original law; and finally—

"(5) That reason, common sense and the results of experience are better guides to law-making than emotion and hysterical propaganda.

"A better popular understanding of these elementary principles might not assure perfection in law-making, but it ought to materially reduce the quantity of misfit legislation enacted at each meeting of the general assembly."

FEDERAL COMMISSIONER ISSUED 62,760 ALCOHOL PERMITS BETWEEN JANUARY 16 AND JUNE 30, 1920.

According to statistics compiled in the office of the Federal Prohibition Commissioner, 62,760 permits for non-beverage alcohol were issued to producers, rectifiers, wholesalers, retail druggists and manufacturers of pharmaceuticals, proprietary medicines, flavoring extracts, syrups, etc., and individuals in the United States and its possessions during the period from January 16, 1920, to June 30. This figure represents the number of licenses approved and recorded at prohibition headquarters, and does not include carriers' transportation permits and physicians' prescription permits issued by the various State prohibition directors.

PENNSYLVANIA BUREAU OF FOODS DENIES SOFT DRINK MAKERS RIGHT TO USE SACCHARINE.

Permission to use saccharine as a substitute for sugar in the manufacture of soft drinks was refused twenty Philadelphia bottling establishments July 1 by Director Foust, of the Bureau of Food.

Representatives of the concerns were informed that under no circumstances will their request to violate the law be granted. The bottlers made a plea on the high cost of sugar and the trouble in getting it. Director Foust declared that sixty other bottling concerns were using sugar and the twenty must do the same or be prosecuted.

NATIONAL PROHIBITION LAW.

Amendments to Regulations 60—Important Revisions of Enforcement Rules Relative to Transportation and Delivery of Intoxicating Liquor—Purchaser Must be Identified before Deliveries are Allowable.

The National Wholesale Druggists' Association *Bulletin* No. 28 conveys the following information to its members, and of value to many A. Ph. A. members. The references apply to Treasury Decision 3041, which may be obtained from Revenue officials:

"In order to prevent the liberal sale of alcohol and other intoxicating liquor made and offered for sale for strictly legal and legitimate purposes to persons or firms engaged in illicit traffic, a number of important changes have been made in Regulations 60. These changes in the main apply to the transportation of liquor and to the issuance of permits to purchase. Under the amended regulations,

authorized by Treasury Decision 3041, the 'fly-by-night' manufacturer or dealer is going to have difficulty in securing supplies of alcohol or other intoxicating liquor, and this will mean that legitimate manufacturers and dealers may hope for less trouble in future in securing supplies for their proper needs. By the terms of T. D. 3041, persons selling intoxicating liquor or permits to purchase must confine deliveries to (*a*) people personally known to them or to persons who have been identified by some party or parties personally known to the vendor; (*b*) bona fide employees of persons personally known or properly identified; or (*c*) to properly qualified transportation carriers who are holders of permits, and who must conform to the regulations governing transportation of liquor.

"Another feature of the amended regulations is the specific instruction to local prohibition directors or other properly authorized government agents to immediately mail or otherwise deliver approved permits to purchase to the vendors, *and to advise the vendee that the permit has been approved, mailed or delivered to the vendor*. These instructions should result in more prompt action on withdrawal permits of wholesale druggists and manufacturers engaged in legitimate business, and thus facilitate the withdrawal and shipment of alcohol for proper uses by and to manufacturers of medicines, and wholesale and retail druggists.

"It is important to note that hereafter no permit to purchase will be approved unless *the name of the vendor appears on the application for permit to purchase, Form 1410*. This in itself should assure greater ease in shipments of alcohol to our members and by them to their customers, at the same time giving the Government a definite line on some of the less responsible dealers and traders who have more recently secured permits and begun operations of a more or less doubtful character.

"We must emphasize the importance of wholesale druggists instructing their salesmen to caution all their customers who use alcohol in any quantity to be absolutely certain of the integrity and responsibility of the persons from whom they make their purchases of alcohol or other intoxicating liquor. It should be especially pointed out that under the terms of amended Regulations 60, the personal solicitation of orders for the purchase of intoxicating liquor, other than ethyl alcohol or sacramental wines, by any person or his agent or representative, *regardless of whether such person holds permit authorizing the sale of intoxicating liquor*, is regarded as illegally advertising the sale of intoxicating liquor. It is also unlawful advertising to furnish price lists or descriptions of such liquor by persons other than manufacturers and *wholesale druggists holding permits*. The safest course for the retail druggist is to confine the purchase of his necessary supplies of alcohol and other intoxicating liquor to be used in the lawful conduct of his business to his regular service wholesale druggist. Furthermore, permits to purchase whiskey, gin, brandy or rum will not be approved in advance, and can only be approved as actually needed."

BOOK NOTICES AND REVIEWS.

A History of Chemistry from the Earliest Times. By James Campbell Brown, Professor of Chemistry in the University of Liverpool. Second Edition, by Henry Hilton Brown. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street. 1920. Price $6.00.

The reviewer laid down this book with regret and pleasure. With regret because he had finished a very interesting story. With pleasure because after its perusal he was convinced that it was a volume of merit and that students of chemistry would find it valuable and profitable. The author of the book, Dr. Brown, evidently prepared the volume after having taught for years, gradually and quietly sifting out an abundance of material, and giving in these pages that which experience indicated to him would best meet the needs of the student of chemistry.

The book is unlike many modern histories of chemistry, and again it bears resemblance to them. It is not based upon a German model. There are also many ear-marks that Dr. Brown was most independent in his thought and availed himself of source material with excellent judgment. There is further no evidence of a French model. It is exactly the product one would expect from a person versed in chemical history who, after years of thought, was seeking to give his pupils a complete picture of the development of their science.

Not to be critical it may, however, be stated that there appear to be room and justification

for remembering the contributions of such American chemists as Robert Hare, Wolcott Gibbs, Ira Remsen, Willard Gibbs, and Theodore W. Richards, particularly as this second edition of the History bears the imprint of a most excellent and conservative American publishing house. With this single demurrer the reviewer heartily recommends Brown's History of Chemistry to lovers and students of chemistry. EDGAR F. SMITH.

A Critical Revision of the Genus Eucalyptus. By J. H. Maiden, I.S.O., F.R.S., F.L.S. (Government Botanist of New South Wales and Director of the Botanic Gardens, Sydney). Vol. IV, parts 9 and 10.

These two parts constitute parts 39 and 40 of the complete work of this important classic monograph. These continue the same style and presentation of the subject matter as the preceding parts. Part 39 is the treatise on the following species of Eucalyptus: *E. Torelliana* F.v.M.; *E. corymbosa* Smith; *E. intermedia* R. T. Baker; *E. patellaris* F.v.M.; *E. celastroides Turczaninow*; *E. gracilis* F.v.M.; *E. transcontinentalis* Maiden; *E. longicornis* F.v.M.; *E. oleosa* F.v.M.; *E. Flocktoniae* Maiden; *E. virgata* Sieber; *E. oreades* R. T. Baker; *E. obtusiflora* DC; *E. fraxinoides* Deane and Maiden.

Part 40 considers the following species: *E. terminalis* F.v.M.; *E. dichromophloia* F.v.M.; *E. pyrophora* Benth; *E. laevopinea* R. T. Baker; *E. ligustrina* DC; *E. stricta* Sieber; *E. grandi* (Hill) Maiden.

The artistic illustrations that have been so characteristic of these monographs are likewise continued in the parts now before us. The data associated with the descriptions are of material commercial value, as well as botanical monographs of the highest type. GEO. M. BERINGER, in *American Journal of Pharmacy.*

NEW PUBLICATIONS.

Food Inspection and Analysis. For the use of Public Analysts, Health Officers, Sanitary Chemists and Food Economists. By Albert E. Leach, S.B., late Chief of the Denver Food and Drug Inspection Laboratory. Revised and enlarged by Andrew L. Winton, Ph.D., formerly Chief of the Chicago Food and Drug Laboratory, Bureau of Chemistry, U. S. Department of Agriculture. 4th Edition. 1090 pp., 129 figures. 41 full-page microphotographic plates. John Wiley & Sons, Inc., New York. Price, cloth, $8.50.

A Textbook of Inorganic Chemistry. Edited by J. Newton Friend, D.Sc., Ph.D., F.I.C. Vol. IX, part 1, 343 pages, contents and index, 8vo. Philadelphia: J. B. Lippincott Company. Price, $6.00.

Chemistry: Laboratory Outline of General Chemistry. H. N. McCoy and E. M. Terry. 154 pp, 20 illustrations. Price, $1.25. McGraw-Hill Book Co., Inc., New York.

Colloids: Grundriss d. Kolloidchemie. Wo. Ostwald. 5th Ed. Part 1. Price, 18 mk. Dunod, Paris.

Enzymes: Biochemical Catalysts in Life and Industry: Proteolytic Enzymes. Jean Effront. Translated by Samuel C. Prescott. 752 pp. Price, $5.00. John Wiley & Sons, Inc., New York.

Handbook: Recipes, Formulas, and Processes. G. D. Hiscox, Editor. 800 pp. Price, $4.00. The N. W. Henley Pub. Co., New York.

Handbook: The Chemists' Year Book. Edited by F. W. Atack, assisted by L. Whinyates. Vols. I and II. 1136 pp. Price, $7.50. Sherratt & Hughes, Manchester, Eng.; Longmans, Green & Co., New York.

The Profession of Chemistry. Richard B. Pilcher. 199 pp. Price, $2.00. D. Van Nostrand Co., New York.

PUBLICATIONS RECEIVED.

The following Theses, presented to the University of Paris, School of Pharmacy, for the Degree of Doctor in Pharmacy:

No. 1. *On the Microbic Infection found in "Trench Feet."* Francois Eugéne Estrader.

No. 2. *Contribution to the Study of Allophanic Ethers.* Louis Belières.

No. 3. *Study of the Alkaloidal Content of Cultivated Belladonna.* Frédéric Beausite.

No. 4. *Contribution to the Study of Styphnic Acid and the Styphnates.* Jean Casimir Périer.

No. 5. *On Some Cyclohexanic Compounds of Mercury.* Élie Gannagé.

No. 6. *Contribution to the Study of Some Derivatives of Tiglic Acid.* Marcel Dematte.

No. 7. *Contribution to the Study of the Biochemical Properties of Bacillus Perfringens.* René Thieulin.